



13-083-3-D2-SQL-Substitute-(12-28-05).txt

SEQUENCE LISTING

<110> BOEHRINGER INGELHEIM (CANADA) LTD.

<120> SELF REPLICATING RNA MOLECULE FROM
HEPATITIS C VIRUS

<130> 13/083-3-D2

<140> 10/789,355

<141> 2004-02-27

<150> 10/309,561

<151> 2002-12-04

<150> 10/029,907

<151> 2001-12-21

<150> 60/257,857

<151> 2000-12-22

<160> 28

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 8639

<212> DNA

<213> HCV

<220>

<221> CDS

<222> (1803)...(8408)

<400> 1

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cc atg gac	cgg gag atg	gca gca tcg tgc gga ggc gcg gtt	ttc gta			1847
Met Asp	Arg Glu Met	Ala Ala Ser Cys Gly Gly Ala Val	Phe Val			

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gca tgc atg ctg gtg cgg aag gtt gct ggg ggt cat tat gtc caa atg	Ala Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met	2183		
gct ctc atg aag ttg gcc gca ctg aca ggt acg tac gtt tat gac cat	Ala Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His	2231		
ctc acc cca ctg cgg gac tgg gcc cac gcg ggc cta cga gac ctt gcg	Leu Thr Pro Leu Arg Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala	2279		
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ccc gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac	Pro Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp	2423		
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tcc caa cag acg cga ggc cta ctt ggc tgc atc atc act agc ctc aca	Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr	2519		
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gac Asp 320	ctt Leu	tac Tyr	ttg Leu	gtc Val	acg Thr 325	agg Arg	cat His	gcc Ala	gat Asp	gtc Val 330	att Ile	ccg Pro	gtg Val	cgc Arg	cgg Arg 335	2807
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gtg Val	gcc Ala	cat His	cta Leu	cac His 420	gcc Ala	cct Pro	act Thr	ggt Gly	agc Ser 425	ggc Gly	aag Lys	agc Ser	act Thr	aag Lys 430	gtg Val	3095
ccg Pro	gct Ala	gcg Ala	tat Tyr 435	gca Ala	gcc Ala	caa Gln	ggg Gly	tat Tyr 440	aag Lys	gtg Val	ctt Leu	gtc Val	ctg Leu 445	aac Asn	ccg Pro	3143
tcc Ser	gtc Val	gcc Ala 450	gcc Ala	acc Thr	cta Leu	ggt Gly	ttc Phe 455	ggg Gly	gcg Ala	tat Tyr	atg Met	tct Ser 460	aag Lys	gca Ala	cat His	3191
ggt Gly 465	atc Ile	gac Asp	cct Pro	aac Asn	atc Ile	aga Arg 470	acc Thr	ggg Gly	gta Val	agg Arg	acc Thr 475	atc Ile	acc Thr	acg Thr	ggt Gly	3239
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tgc Cys	tct Ser	ggg Gly	ggc Gly	gcc Ala 500	tat Tyr	gac Asp	atc Ile	ata Ile	ata Ile 505	tgt Cys	gat Asp	gag Glu	tgc Cys	cac His 510	tca Ser	3335
act Thr	gac Asp	tcg Ser	acc Thr 515	act Thr	atc Ile	ctg Leu	ggc Gly	atc Ile 520	ggc Gly	aca Thr	gtc Val	ctg Leu	gac Asp 525	caa Gln	gcg Ala	3383
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Ile	Lys	Gly	Gly	Arg	His	Leu	Ile	Phe	Cys	His	Ser	Lys	Lys	Lys	Cys		
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Tyr	Tyr	Arg	Gly	Leu	Asp	Val	Ser	Val	Ile	Pro	Thr	Ser	Gly	Asp	Val		
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Asp	Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys	Val	Thr	Gln	Thr	Val	Asp	Phe		
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agc	ctg	gac	ccg	acc	ttc	acc	att	gag	acg	acg	acc	gtg	cca	caa	gac		3815
Ser	Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu	Thr	Thr	Thr	Val	Pro	Gln	Asp		
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gcg	gtg	tca	cgc	tcg	cag	cgg	cga	ggc	agg	act	ggt	agg	ggc	agg	atg		3863
Ala	Val	Ser	Arg	Ser	Gln	Arg	Arg	Gly	Arg	Thr	Gly	Arg	Gly	Arg	Met		
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Asp	Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr	Asp	Ala	Gly	Cys	Ala	Trp	Tyr		
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Glu	Leu	Thr	Pro	Ala	Glu	Thr	Ser	Val	Arg	Leu	Arg	Ala	Tyr	Leu	Asn		
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Val	Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro	Pro	Ser	Trp	Asp	Gln	Met	Trp		
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Lys	Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr	Leu	His	Gly	Pro	Thr	Pro	Leu		
800					805					810					815		
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ccc Pro	gcg Ala	ata Ile	gca Ala	tca Ser 980	ctg Leu	atg Met	gca Ala	ttc Phe	aca Thr 985	gcc Ala	tct Ser	atc Ile	acc Thr	agc Ser 990	ccg Pro	4775
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gtc tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc Val Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val 1120 1125 1130 1135			5207
act cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt Thr Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu 1140 1145 1150			5255
cac cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg His Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp 1155 1160 1165			5303
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atg acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa Met Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu 1300 1305 1310			5735
ttc ttc aca gaa gtg gat ggg gtg cgg ttg cac agg tac gct cca gcg Phe Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala 1315 1320 1325			5783
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caa tac ctg gtt ggg tca cag ctc cca tgc gag ccc gaa ccg gac gta Gln Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val 1345 1350 1355			5879
gca gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag Ala Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu 1360 1365 1370			5927

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caa ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc Gln Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser 2050			7991
att gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt Ile Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu 2065			8039
agc gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg Ser Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val 2080			8087
gct tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga Ala Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg 2100			8135
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gct gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag Ala Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys 2130			8231
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cgt gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta Arg Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Leu Ser Val 2175			8375

ggg gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca 8428
Gly Val Gly Ile Tyr Leu Leu Pro Asn Arg *
2195 2200

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<221> variation
<222> 6268
<223> r = a or g

<221> variation
<222> 4446
<223> r = a or g

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gacgaccggg tcctttcttg gatcaaccgc ctcaatgcct ggagatttgg gcgtgccccc 240
gacgagactgc tagccgagta gtgttggtgc gcgaaaggcc ttgtggtact gcctgatagg 300
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c atg gac cgg gag atg gca gca tcg tgc gga ggc gcg gtt ttc gta ggt 1849
Met Asp Arg Glu Met Ala Ala Ser Cys Gly Ala Val Phe Val Gly
1 5 10 15

ctg ata ctc ttg acc ttg tca ccg cac tat aag ctg ttc ctc gct agg 1897
Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala Arg
20 25 30

ctc ata tgg tgg tta caa tat ttt atc acc agg gcc gag gca cac ttg 1945
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Gln	Val	Trp	Ile	Pro	Pro	Leu	Asn	Val	Arg	Gly	Gly	Arg	Asp	Ala	Val	
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atc	ctc	ctc	acg	tgc	gcg	atc	cac	cca	gag	cta	atc	ttt	acc	atc	acc	2041
Ile	Leu	Leu	Thr	Cys	Ala	Ile	His	Pro	Glu	Leu	Ile	Phe	Thr	Ile	Thr	
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Lys	Ile	Leu	Leu	Ala	Ile	Leu	Gly	Pro	Leu	Met	Val	Leu	Gln	Ala	Gly	
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Ile	Thr	Lys	Val	Pro	Tyr	Phe	Val	Arg	Ala	His	Gly	Leu	Ile	Arg	Ala	
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tgc	atg	ctg	gtg	cgg	aag	gtt	gct	ggg	ggt	cat	tat	gtc	caa	atg	gct	2185
Cys	Met	Leu	Val	Arg	Lys	Val	Ala	Gly	Gly	His	Tyr	Val	Gln	Met	Ala	
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acc	cca	ctg	cgg	gac	tgg	gcc	cac	gcg	ggc	cta	cga	gac	ctt	gcg	gtg	2281
Thr	Pro	Leu	Arg	Asp	Trp	Ala	His	Ala	Gly	Leu	Arg	Asp	Leu	Ala	Val	
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Ala	Val	Glu	Pro	Val	Val	Phe	Ser	Asp	Met	Glu	Thr	Lys	Val	Ile	Thr	
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Tyr	His	Gly	Ala	Gly	Ser	Lys	Thr	Leu	Ala	Gly	Pro	Lys	Gly	Pro	Ile	
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acg Thr	gct Ala 530	gga Gly	gcg Ala	cga Arg	ctc Leu	gtc Val 535	gtg Val	ctc Leu	gcc Ala	acc Thr	gct Ala 540	acg Thr	cct Pro	ccg Pro	gga Gly	3433
tcg Ser 545	gtc Val	acc Thr	gtg Val	cca Pro	cat His 550	cca Pro	aac Asn	atc Ile	gag Glu	gag Glu 555	gtg Val	gct Ala	ctg Leu	tcc Ser	agc Ser 560	3481
act Thr	gga Gly	gaa Glu	atc Ile	ccc Pro 565	ttt Phe	tat Tyr	ggc Gly	aaa Lys	gcc Ala 570	atc Ile	ccc Pro	atc Ile	gag Glu	acc Thr 575	atc Ile	3529
aag	ggg	ggg	agg	cac	ctc	att	ttc	tgc	cat	tcc	aag	aag	aaa	tgt	gat	3577

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Lys	Gly	Gly	Arg 580	His	Leu	Ile	Phe	Cys 585	His	Ser	Lys	Lys	Lys 590	Cys	Asp		
gag Glu	ctc Leu	gcc Ala 595	gcg Ala	aag Lys	ctg Leu	tcc Ser	ggc Gly 600	ctc Leu	gga Gly	ctc Leu	aat Asn	gct Ala 605	gta Val	gca Ala	tat Tyr	3625	
tac Tyr	cgg Arg 610	ggc Gly	ctt Leu	gat Asp	gta Val	tcc Ser 615	gtc Val	ata Ile	cca Pro	act Thr	agc Ser 620	gga Gly	gac Asp	gtc Val	att Ile	3673	
gtc Val 625	gta Val	gca Ala	acg Thr	gac Asp	gct Ala 630	cta Leu	atg Met	acg Thr	ggc Gly	ttt Phe 635	acc Thr	ggc Gly	gat Asp	ttc Phe	gac Asp 640	3721	
tca Ser	gtg Val	atc Ile	gac Asp	tgc Cys 645	aat Asn	aca Thr	tgt Cys	gtc Val	acc Thr 650	cag Gln	aca Thr	gtc Val	gac Asp	ttc Phe 655	agc Ser	3769	
ctg Leu	gac Asp	ccg Pro	acc Thr 660	ttc Phe	acc Thr	att Ile	gag Glu	acg Thr 665	acg Thr	acc Thr	gtg Val	cca Pro	caa Gln 670	gac Asp	gcg Ala	3817	
gtg Val	tca Ser	cgc Arg 675	tcg Ser	cag Gln	cgg Arg	cga Arg	ggc Gly 680	agg Arg	act Thr	ggt Gly	agg Arg	ggc Gly 685	agg Arg	atg Met	ggc Gly	3865	
att Ile	tac Tyr 690	agg Arg	ttt Phe	gtg Val	act Thr	cca Pro 695	gga Gly	gaa Glu	cgg Arg	ccc Pro	tcg Ser 700	ggc Gly	atg Met	ttc Phe	gat Asp	3913	
tcc Ser 705	tcg Ser	gtt Val	ctg Leu	tgc Cys	gag Glu 710	tgc Cys	tat Tyr	gac Asp	gcg Ala	ggc Gly 715	tgt Cys	gct Ala	tgg Trp	tac Tyr	gag Glu 720	3961	
ctc Leu	acg Thr	ccc Pro	gcc Ala	gag Glu 725	acc Thr	tca Ser	gtt Val	agg Arg 730	cgg Arg	gct Ala	tac Tyr	cta Leu	aac Asn 735	aca Thr		4009	
cca Pro	ggg Gly	ttg Leu	ccc Pro 740	gtc Val	tgc Cys	cag Gln	gac Asp	cat His 745	ctg Leu	gag Glu	ttc Phe	tgg Trp	gag Glu 750	agc Ser	gtc Val	4057	
ttt Phe	aca Thr	ggc Gly 755	ctc Leu	acc Thr	cac His	ata Ile	gac Asp 760	gcc Ala	cat His	ttc Phe	ttg Leu	tcc Ser 765	cag Gln	act Thr	aag Lys	4105	
cag Gln	gca Ala 770	gga Gly	gac Asp	aac Asn	ttc Phe	ccc Pro 775	tac Tyr	ctg Leu	gta Val	gca Ala	tac Tyr 780	cag Gln	gct Ala	acg Thr	gtg Val	4153	
tgc Cys 785	gcc Ala	agg Arg	gct Ala	cag Gln	gct Ala 790	cca Pro	cct Pro	cca Pro	tcg Ser	tgg Trp 795	gac Asp	caa Gln	atg Met	tgg Trp	aag Lys 800	4201	
tgt Cys	ctc Leu	ata Ile	cgg Arg	cta Leu 805	aag Lys	cct Pro	acg Thr	ctg Leu	cac His 810	ggg Gly	cca Pro	acg Thr	ccc Pro	ctg Leu 815	ctg Leu	4249	
tat Tyr	agg Arg	ctg Leu	gga Gly 820	gcc Ala	gtt Val	caa Gln	aac Asn	gag Glu 825	gtt Val	act Thr	acc Thr	aca Thr	cac His 830	ccc Pro	ata Ile	4297	
acc Thr	aaa Lys	tac Tyr 835	atc Ile	atg Met	gca Ala	tgc Cys	atg Met 840	tcg Ser	gct Ala	gac Asp	ctg Leu	gag Glu 845	gtc Val	gtc Val	acg Thr	4345	
agc	acc	tgg	gtg	ctg	gta	ggc	gga	gtc	cta	gca	gct	ctg	gcc	gcg	tat	4393	

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Ser	Thr	Trp	Val	Leu	Val	Gly	Gly	Val	Leu	Ala	Ala	Leu	Ala	Ala	Tyr	
850						855					860					
tgc	ctg	aca	aca	ggc	agc	gtg	gtc	att	gtg	ggc	agg	atc	atc	ttg	tcc	4441
Cys	Leu	Thr	Thr	Gly	Ser	Val	Val	Ile	Val	Gly	Arg	Ile	Ile	Leu	Ser	
865					870					875					880	
gga	arg	ccg	gcc	atc	att	ccc	gac	agg	gaa	gtc	ctt	tac	cgg	gag	ttc	4489
Gly	Xaa	Pro	Ala	Ile	Ile	Pro	Asp	Arg	Glu	Val	Leu	Tyr	Arg	Glu	Phe	
				885					890					895		
gat	gag	atg	gaa	gag	tgc	gcc	tca	cac	ctc	cct	tac	atc	gaa	cag	gga	4537
Asp	Glu	Met	Glu	Glu	Cys	Ala	Ser	His	Leu	Pro	Tyr	Ile	Glu	Gln	Gly	
				900				905					910			
atg	cag	ctc	gcc	gaa	caa	ttc	aaa	cag	aag	gca	atc	ggg	ttg	ctg	caa	4585
Met	Gln	Leu	Ala	Glu	Gln	Phe	Lys	Gln	Lys	Ala	Ile	Gly	Leu	Leu	Gln	
		915					920					925				
aca	gcc	acc	aag	caa	gcg	gag	gct	gct	gct	ccc	gtg	gtg	gaa	tcc	aag	4633
Thr	Ala	Thr	Lys	Gln	Ala	Glu	Ala	Ala	Ala	Pro	Val	Val	Glu	Ser	Lys	
	930					935					940					
tgg	cgg	acc	ctc	gaa	gcc	ttc	tgg	gcg	aag	cat	atg	tgg	aat	ttc	atc	4681
Trp	Arg	Thr	Leu	Glu	Ala	Phe	Trp	Ala	Lys	His	Met	Trp	Asn	Phe	Ile	
945					950					955					960	
agc	ggg	ata	caa	tat	tta	gca	ggc	ttg	tcc	act	ctg	cct	ggc	aac	ccc	4729
Ser	Gly	Ile	Gln	Tyr	Leu	Ala	Gly	Leu	Ser	Thr	Leu	Pro	Gly	Asn	Pro	
				965					970					975		
gcg	ata	gca	tca	ctg	atg	gca	ttc	aca	gcc	tct	atc	acc	agc	ccg	ctc	4777
Ala	Ile	Ala	Ser	Leu	Met	Ala	Phe	Thr	Ala	Ser	Ile	Thr	Ser	Pro	Leu	
			980					985					990			
acc	acc	caa	cat	acc	ctc	ctg	ttt	aac	atc	ctg	ggg	gga	tgg	gtg	gcc	4825
Thr	Thr	Gln	His	Thr	Leu	Leu	Phe	Asn	Ile	Leu	Gly	Trp	Val	Val	Ala	
		995					1000					1005				
gcc	caa	ctt	gct	cct	ccc	agc	gct	gct	tct	gct	ttc	gta	ggc	gcc	ggc	4873
Ala	Gln	Leu	Ala	Pro	Pro	Ser	Ala	Ala	Ser	Ala	Phe	Val	Gly	Ala	Gly	
	1010					1015					1020					
atc	gct	gga	gcg	gct	gtt	ggc	agc	ata	ggc	ctt	ggg	aag	gtg	ctt	gtg	4921
Ile	Ala	Gly	Ala	Ala	Val	Gly	Ser	Ile	Gly	Leu	Gly	Lys	Val	Leu	Val	
1025					1030					1035					1040	
gat	att	ttg	gca	ggc	tat	gga	gca	ggg	gtg	gca	ggc	gcg	ctc	gtg	gcc	4969
Asp	Ile	Leu	Ala	Gly	Tyr	Gly	Ala	Gly	Val	Ala	Gly	Ala	Leu	Val	Ala	
				1045					1050					1055		
ttt	aag	gtc	atg	agc	ggc	gag	atg	ccc	tcc	acc	gag	gac	ctg	gtt	aac	5017
Phe	Lys	Val	Met	Ser	Gly	Glu	Met	Pro	Ser	Thr	Glu	Asp	Leu	Val	Asn	
			1060					1065					1070			
cta	ctc	cct	gct	atc	ctc	tcc	cct	ggc	gcc	cta	gtc	gtc	ggg	gtc	gtg	5065
Leu	Leu	Pro	Ala	Ile	Leu	Ser	Pro	Gly	Ala	Leu	Val	Val	Gly	Val	Val	
		1075					1080					1085				
tgc	gca	gcg	ata	ctg	cgt	cgg	cac	gtg	ggc	cca	ggg	gag	ggg	gct	gtg	5113
Cys	Ala	Ala	Ile	Leu	Arg	Arg	His	Val	Gly	Pro	Gly	Glu	Gly	Ala	Val	
	1090					1095					1100					
cag	tgg	atg	aac	cgg	ctg	ata	gcg	ttc	gct	tcg	cgg	ggt	aac	cac	gtc	5161
Gln	Trp	Met	Asn	Arg	Leu	Ile	Ala	Phe	Ala	Ser	Arg	Gly	Asn	His	Val	
1105					1110					1115					1120	
tcc	ccc	acg	cac	tat	gtg	cct	gag	agc	gac	gct	gca	gca	cgt	gtc	act	5209

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Ser	Pro	Thr	His	Tyr	Val	Pro	Glu	Ser	Asp	Ala	Ala	Ala	Arg	Val	Thr		
				1125					1130					1135			
cag	atc	ctc	tct	agt	ctt	acc	atc	act	cag	ctg	ctg	aag	agg	ctt	cac	5257	
Gln	Ile	Leu	Ser	Ser	Leu	Thr	Ile	Thr	Gln	Leu	Leu	Lys	Arg	Leu	His		
			1140					1145					1150				
cag	tgg	atc	aac	gag	gac	tgc	tcc	acg	cca	tgc	tcc	ggc	tcg	tgg	cta	5305	
Gln	Trp	Ile	Asn	Glu	Asp	Cys	Ser	Thr	Pro	Cys	Ser	Gly	Ser	Trp	Leu		
		1155				1160						1165					
aga	gat	gtt	tgg	gat	tgg	ata	tgc	acg	gtg	ttg	act	gat	ttc	aag	acc	5353	
Arg	Asp	Val	Trp	Asp	Trp	Ile	Cys	Thr	Val	Leu	Thr	Asp	Phe	Lys	Thr		
	1170					1175					1180						
tgg	ctc	cag	tcc	aag	ctc	ctg	ccg	cga	ttg	ccg	gga	gtc	ccc	ttc	ttc	5401	
Trp	Leu	Gln	Ser	Lys	Leu	Leu	Pro	Arg	Leu	Pro	Gly	Val	Pro	Phe	Phe		
1185					1190					1195					1200		
tca	tgt	caa	cgt	ggg	tac	aag	gga	gtc	tgg	cgg	ggc	gac	ggc	atc	atg	5449	
Ser	Cys	Gln	Arg	Gly	Tyr	Lys	Gly	Val	Trp	Arg	Gly	Asp	Gly	Ile	Met		
				1205					1210					1215			
caa	acc	acc	tgc	cca	tgt	gga	gca	cag	atc	acc	gga	cat	gtg	aaa	aac	5497	
Gln	Thr	Thr	Cys	Pro	Cys	Gly	Ala	Gln	Ile	Thr	Gly	His	Val	Lys	Asn		
			1220					1225					1230				
tgt	tcc	atg	agg	atc	gtg	ggg	cct	agg	acc	tgt	agt	aac	acg	tgg	cat	5545	
Cys	Ser	Met	Arg	Ile	Val	Gly	Pro	Arg	Thr	Cys	Ser	Asn	Thr	Trp	His		
		1235					1240					1245					
gga	aca	ttc	ccc	att	aac	gcg	tac	acc	acg	ggc	ccc	tgc	acg	ccc	tcc	5593	
Gly	Thr	Phe	Pro	Ile	Asn	Ala	Tyr	Thr	Thr	Gly	Pro	Cys	Thr	Pro	Ser		
	1250					1255					1260						
ccg	gcg	cca	aat	tat	tct	agg	gcg	ctg	tgg	cgg	gtg	gct	gct	gag	gag	5641	
Pro	Ala	Pro	Asn	Tyr	Ser	Arg	Ala	Leu	Trp	Arg	Val	Ala	Ala	Glu	Glu		
1265					1270				1275						1280		
tac	gtg	gag	gtt	acg	cgg	gtg	ggg	gat	ttc	cac	tac	gtg	acg	ggc	atg	5689	
Tyr	Val	Glu	Val	Thr	Arg	Val	Gly	Asp	Phe	His	Tyr	Val	Thr	Gly	Met		
				1285					1290					1295			
acc	act	gac	aac	gta	aag	tgc	ccg	tgt	cag	gtt	ccg	gcc	ccc	gaa	ttc	5737	
Thr	Thr	Asp	Asn	Val	Lys	Cys	Pro	Cys	Gln	Val	Pro	Ala	Pro	Glu	Phe		
			1300					1305					1310				
ttc	aca	gaa	gtg	gat	ggg	gtg	cgg	ttg	cac	agg	tac	gct	cca	gcg	tgc	5785	
Phe	Thr	Glu	Val	Asp	Gly	Val	Arg	Leu	His	Arg	Tyr	Ala	Pro	Ala	Cys		
		1315					1320					1325					
aaa	ccc	ctc	cta	cgg	gag	gag	gtc	aca	ttc	ctg	gtc	ggg	ctc	aat	caa	5833	
Lys	Pro	Leu	Leu	Arg	Glu	Glu	Val	Thr	Phe	Leu	Val	Gly	Leu	Asn	Gln		
	1330					1335					1340						
tac	ctg	gtt	ggg	tca	cag	ctc	cca	tgc	gag	ccc	gaa	ccg	gac	gta	gca	5881	
Tyr	Leu	Val	Gly	Ser	Gln	Leu	Pro	Cys	Glu	Pro	Glu	Pro	Asp	Val	Ala		
1345					1350				1355						1360		
gtg	ctc	act	tcc	atg	ctc	acc	gac	ccc	tcc	cac	att	acg	gcg	gag	acg	5929	
Val	Leu	Thr	Ser	Met	Leu	Thr	Asp	Pro	Ser	His	Ile	Thr	Ala	Glu	Thr		
				1365					1370					1375			
gct	aag	cgt	agg	ctg	gcc	agg	gga	tct	ccc	ccc	tcc	ttg	gcc	agc	tca	5977	
Ala	Lys	Arg	Arg	Leu	Ala	Arg	Gly	Ser	Pro	Pro	Ser	Leu	Ala	Ser	Ser		
			1380					1385					1390				
tca	gct	agc	cag	ctg	tct	gcg	cct	tcc	ttg	aag	gca	aca	tgc	act	acc	6025	

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Ser	Ala	Ser	Gln	Leu	Ser	Ala	Pro	Ser	Leu	Lys	Ala	Thr	Cys	Thr	Thr		
		1395					1400						1405				
cgt	cat	gac	tcc	ccg	gac	gct	gac	ctc	atc	gag	gcc	aac	ctc	ctg	tgg	6073	
Arg	His	Asp	Ser	Pro	Asp	Ala	Asp	Leu	Ile	Glu	Ala	Asn	Leu	Leu	Trp		
	1410					1415					1420						
cgg	cag	gag	atg	ggc	ggg	aac	atc	acc	cgc	gtg	gag	tca	gaa	aat	aag	6121	
Arg	Gln	Glu	Met	Gly	Gly	Asn	Ile	Thr	Arg	Val	Glu	Ser	Glu	Asn	Lys		
	1425				1430					1435					1440		
gta	gta	att	ttg	gac	tct	ttc	gag	ccg	ctc	caa	gcg	gag	gag	gat	gag	6169	
Val	Val	Ile	Leu	Asp	Ser	Phe	Glu	Pro	Leu	Gln	Ala	Glu	Glu	Asp	Glu		
				1445					1450					1455			
agg	gaa	gta	tcc	gtt	ccg	gcg	gag	atc	ctg	cgg	agg	tcc	agg	aaa	ttc	6217	
Arg	Glu	Val	Ser	Val	Pro	Ala	Glu	Ile	Leu	Arg	Arg	Ser	Arg	Lys	Phe		
			1460					1465					1470				
cct	cga	gcg	atg	ccc	ata	tgg	gca	cgc	ccg	gat	tac	aac	cct	cca	ctg	6265	
Pro	Arg	Ala	Met	Pro	Ile	Trp	Ala	Arg	Pro	Asp	Tyr	Asn	Pro	Pro	Leu		
		1475					1480					1485					
ttr	gag	tcc	tgg	aag	gac	ccg	gac	tac	gtc	cct	cca	gtg	gta	cac	ggg	6313	
Xaa	Glu	Ser	Trp	Lys	Asp	Pro	Asp	Tyr	Val	Pro	Pro	Val	Val	His	Gly		
	1490					1495					1500						
tgt	cca	ttg	ccg	cct	gcc	aag	gcc	cct	ccg	ata	cca	cct	cca	cgg	agg	6361	
Cys	Pro	Leu	Pro	Pro	Ala	Lys	Ala	Pro	Pro	Ile	Pro	Pro	Pro	Arg	Arg		
	1505				1510					1515					1520		
aag	agg	acg	gtt	gtc	ctg	tca	gaa	tct	acc	gtg	tct	tct	gcc	ttg	gcg	6409	
Lys	Arg	Thr	Val	Val	Leu	Ser	Glu	Ser	Thr	Val	Ser	Ser	Ala	Leu	Ala		
				1525					1530					1535			
gag	ctc	gcc	aca	aag	acc	ttc	ggc	agc	tcc	gaa	tcg	tcg	gcc	gtc	gac	6457	
Glu	Leu	Ala	Thr	Lys	Thr	Phe	Gly	Ser	Ser	Glu	Ser	Ser	Ala	Val	Asp		
			1540					1545					1550				
agc	ggc	acg	gca	acg	gcc	tct	cct	gac	cag	ccc	tcc	gac	gac	ggc	gac	6505	
Ser	Gly	Thr	Ala	Thr	Ala	Ser	Pro	Asp	Gln	Pro	Ser	Asp	Asp	Gly	Asp		
		1555					1560					1565					
gcg	gga	tcc	gac	gtt	gag	tcg	tac	tcc	tcc	atg	ccc	ccc	ctt	gag	ggg	6553	
Ala	Gly	Ser	Asp	Val	Glu	Ser	Tyr	Ser	Ser	Met	Pro	Pro	Leu	Glu	Gly		
	1570					1575					1580						
gag	ccg	ggg	gat	ccc	gat	ctc	agc	gac	ggg	tct	tgg	tct	acc	gta	agc	6601	
Glu	Pro	Gly	Asp	Pro	Asp	Leu	Ser	Asp	Gly	Ser	Trp	Ser	Thr	Val	Ser		
	1585				1590				1595						1600		
gag	gag	gct	agt	gag	gac	gtc	gtc	tgc	tgc	tcg	atg	tcc	tac	aca	tgg	6649	
Glu	Glu	Ala	Ser	Glu	Asp	Val	Val	Cys	Cys	Ser	Met	Ser	Tyr	Thr	Trp		
				1605					1610					1615			
aca	ggc	gcc	ctg	atc	acg	cca	tgc	gct	gcg	gag	gaa	acc	aag	ctg	ccc	6697	
Thr	Gly	Ala	Leu	Ile	Thr	Pro	Cys	Ala	Ala	Glu	Glu	Thr	Lys	Leu	Pro		
			1620					1625					1630				
atc	aat	gca	ctg	agc	aac	tct	ttg	ctc	cgt	cac	cac	aac	ttg	gtc	tat	6745	
Ile	Asn	Ala	Leu	Ser	Asn	Ser	Leu	Leu	Arg	His	His	Asn	Leu	Val	Tyr		
		1635					1640					1645					
gct	aca	aca	tct	cgc	agc	gca	agc	ctg	cgg	cag	aag	aag	gtc	acc	ttt	6793	
Ala	Thr	Thr	Ser	Arg	Ser	Ala	Ser	Leu	Arg	Gln	Lys	Lys	Val	Thr	Phe		
	1650					1655					1660						
gac	aga	ctg	cag	gtc	ctg	gac	gac	cac	tac	cgg	gac	gtg	ctc	aag	gag	6841	

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Asp Arg Leu Gln Val	Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu	
1665	1670 1675 1680	
atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag		6889
Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu	1685 1690 1695	
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc		6937
Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly	1700 1705 1710	
tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac		6985
Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His	1715 1720 1725	
atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att		7033
Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile	1730 1735 1740	
gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag		7081
Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu	1745 1750 1755 1760	
aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg		7129
Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly	1765 1770 1775	
gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc		7177
Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu	1780 1785 1790	
cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga		7225
Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly	1795 1800 1805	
cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct		7273
Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro	1810 1815 1820	
atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag		7321
Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu	1825 1830 1835 1840	
aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc		7369
Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala	1845 1850 1855	
ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc		7417
Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile	1860 1865 1870	
ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg		7465
Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg	1875 1880 1885	
tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca		7513
Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr	1890 1895 1900	
tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac		7561
Cys Tyr Leu Lys Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp	1905 1910 1915 1920	
tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc		7609
Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser	1925 1930 1935	
gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct		7657

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Ala	Gly	Thr	Gln	Glu	Asp	Glu	Ala	Ser	Leu	Arg	Ala	Phe	Thr	Glu	Ala			
			1940						1945					1950				
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Met	Thr	Arg	Tyr	Ser	Ala	Pro	Pro	Gly	Asp	Pro	Pro	Lys	Pro	Glu	Tyr			
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gat	gca	tct	ggc	aaa	agg	gtg	tac	tat	ctc	acc	cgt	gac	ccc	acc	acc	7801		
Asp	Ala	Ser	Gly	Lys	Arg	Val	Tyr	Tyr	Leu	Thr	Arg	Asp	Pro	Thr	Thr			
	1985				1990					1995					2000			
ccc	ctt	gcg	cgg	gct	gcg	tgg	gag	aca	gct	aga	cac	act	cca	gtc	aat	7849		
Pro	Leu	Ala	Arg	Ala	Ala	Trp	Glu	Thr	Ala	Arg	His	Thr	Pro	Val	Asn			
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tcc	tgg	cta	ggc	aac	atc	atc	atg	tat	gcg	ccc	acc	ttg	tgg	gca	agg	7897		
Ser	Trp	Leu	Gly	Asn	Ile	Ile	Met	Tyr	Ala	Pro	Thr	Leu	Trp	Ala	Arg			
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Met	Ile	Leu	Met	Thr	His	Phe	Phe	Ser	Ile	Leu	Leu	Ala	Gln	Glu	Gln			
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Leu	Glu	Lys	Ala	Leu	Asp	Cys	Gln	Ile	Tyr	Gly	Ala	Cys	Tyr	Ser	Ile			
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Ser	Cys	Leu	Arg	Lys	Leu	Gly	Val	Pro	Pro	Leu	Arg	Val	Trp	Arg	His			
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cgg	gcc	aga	agt	gtc	cgc	gct	agg	cta	ctg	tcc	cag	ggg	ggg	agg	gct	8185		
Arg	Ala	Arg	Ser	Val	Arg	Ala	Arg	Leu	Leu	Ser	Gln	Gly	Gly	Arg	Ala			
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gcc	act	tgt	ggc	aag	tac	ctc	ttc	aac	tgg	gca	gta	agg	acc	aag	ctc	8233		
Ala	Thr	Cys	Gly	Lys	Tyr	Leu	Phe	Asn	Trp	Ala	Val	Arg	Thr	Lys	Leu			
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Lys	Leu	Thr	Pro	Ile	Pro	Ala	Ala	Ser	Gln	Leu	Asp	Leu	Ser	Ser	Trp			
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ttc	gtt	gct	ggt	tac	agc	ggg	gga	gac	ata	tat	cac	agc	ctg	tct	cgt	8329		
Phe	Val	Ala	Gly	Tyr	Ser	Gly	Gly	Asp	Ile	Tyr	His	Ser	Leu	Ser	Arg			
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gcc	cga	ccc	cgc	tgg	ttc	atg	tgg	tgc	cta	ctc	cta	ctt	tct	gta	ggg	8377		
Ala	Arg	Pro	Arg	Trp	Phe	Met	Trp	Cys	Leu	Leu	Leu	Leu	Ser	Val	Gly			
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gta	ggc	atc	tat	cta	ctc	ccc	aac	cga	tga	acg	ggg	agct	aaac	act	cca	8427		
Val	Gly	Ile	Tyr	Leu	Leu	Pro	Asn	Arg	*									
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 Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val
 50 55 60
 Ile Leu Leu Thr Cys Ala Ile His Pro Glu Leu Ile Phe Thr Ile Thr
 65 70 75 80
 Lys Ile Leu Leu Ala Ile Leu Gly Pro Leu Met Val Leu Gln Ala Gly
 85 90 95
 Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg Ala
 100 105 110
 Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met Ala
 115 120 125
 Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu
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 Thr Pro Leu Arg Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val
 145 150 155 160
 Ala Val Glu Pro Val Val Phe Ser Asp Met Glu Thr Lys Val Ile Thr
 165 170 175
 Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Leu Gly Leu Pro
 180 185 190
 Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser
 195 200 205
 Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser
 210 215 220
 Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly
 225 230 235 240
 Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala
 245 250 255
 Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val
 260 265 270
 Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile
 275 280 285
 Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala
 290 295 300
 Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp
 305 310 315 320
 Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg
 325 330 335
 Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu
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 Lys Gly Ser Ser Gly Gly Pro Leu Cys Pro Ser Gly His Ala Val
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 Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val
 370 375 380
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	Ala	His	Leu	His	420	Ala	Gln	Gly	Tyr	425	Lys	Val	Leu	Val	Leu	430	Asn	Pro	Ser
			435	Ala		Ala	Gly	Phe	440	Gly	Ala	Tyr	Met	Ser	Lys	Ala	His	Gly	
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Ile	Asp	Pro	Asn	Ile	Arg	Thr	Tyr	Gly	Lys	Phe	Leu	Ala	Asp	Gly	Gly	Cys			
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Ser	Gly	Gly	Ala	Tyr	Asp	Ile	Ile	Ile	520	Gly	Thr	Val	Leu	Asp	Gln	Ala	Glu		
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Ser	Val	Thr	Val	Pro	His	Pro	Asn	Ile	Glu	Glu	Val	Ala	Leu	Ser	Ser				
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Lys	Gly	Gly	Arg	His	Leu	Ile	Phe	Cys	His	Ser	Lys	Lys	Lys	Cys	Asp				
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Tyr	Arg	Gly	Leu	Asp	Val	Ser	Val	Ile	Pro	Thr	Ser	Gly	Asp	Val	Ile				
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Val	Val	Ala	Thr	Asp	Ala	Leu	Met	Thr	Gly	Phe	Thr	Gly	Asp	Phe	Asp				
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Ile	Tyr	Arg	Phe	Val	Thr	Pro	Gly	Glu	Arg	Pro	Ser	Gly	Met	Phe	Asp				
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Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr	Asp	Ala	Gly	Cys	Ala	Trp	Tyr	Glu				
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Leu	Thr	Pro	Ala	Glu	Thr	Ser	Val	Arg	Leu	Arg	Ala	Tyr	Leu	Asn	Thr				
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Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp	His	Leu	Glu	Phe	Trp	Glu	Ser	Val				
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Phe	Thr	Gly	Leu	Thr	His	Ile	Asp	Ala	His	Phe	Leu	Ser	Gln	Thr	Lys				
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Gln	Ala	Gly	Asp	Asn	Phe	Pro	Tyr	Leu	Val	Ala	Tyr	Gln	Ala	Thr	Val				
	770					775						780							
Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro	Pro	Ser	Trp	Asp	Gln	Met	Trp	Lys				
785					790					795					800				
Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr	Leu	His	Gly	Pro	Thr	Pro	Leu	Leu				
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Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn	Glu	Val	Thr	Thr	Thr	His	Pro	Ile				
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Thr	Lys	Tyr	Ile	Met	Ala	Cys	Met	Ser	Ala	Asp	Leu	Glu	Val	Val	Thr				
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Ser	Thr	Trp	Val	Leu	Val	Gly	Gly	Val	Leu	Ala	Ala	Leu	Ala	Ala	Tyr				
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Cys	Leu	Thr	Thr	Gly	Ser	Val	Val	Ile	Val	Gly	Arg	Ile	Ile	Leu	Ser				
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Met	Gln	Leu	Ala	Glu	Gln	Phe	Lys	Gln	Lys	Ala	Ile	Gly	Leu	Leu	Gln				
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 965 970 975
 Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ser Ile Thr Ser Pro Leu
 980 985 990
 Thr Thr Gln His Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala
 995 1000 1005
 Ala Gln Leu Ala Pro Pro Ser Ala Ala Ser Ala Phe Val Gly Ala Gly
 1010 1015 1020
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 1025 1030 1035 1040
 Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala
 1045 1050 1055
 Phe Lys Val Met Ser Gly Glu Met Pro Ser Thr Glu Asp Leu Val Asn
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 1075 1080 1085
 Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val
 1090 1095 1100
 Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val
 1105 1110 1115 1120
 Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Arg Val Thr
 1125 1130 1135
 Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His
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 Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu
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 Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Thr
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 Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe
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 Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met
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 Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn
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 Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His
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 Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser
 1250 1255 1260
 Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu
 1265 1270 1275 1280
 Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met
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 Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe
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 1315 1320 1325
 Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln
 1330 1335 1340
 Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala
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 Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp
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 Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu
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 Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe
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 1570 1575 1580
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 Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp
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 Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro
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 Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr
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 Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe
 1650 1655 1660
 Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu
 1665 1670 1675
 Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu
 1685 1690 1695
 Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly
 1700 1705 1710
 Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His
 1715 1720 1725
 Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile
 1730 1735 1740
 Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu
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 Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly
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 Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu
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 Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly
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 Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro
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 Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala
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 1905 1910 1915
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 1925 1930 1935
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 2005 2010 2015
 Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg
 Page 22

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Ala	Arg	Pro	Arg	Trp	Phe	Met	Trp	Cys	Leu	Leu	Leu	Leu	Ser	Val	Gly	
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Gln	Val	Trp	Ile	Pro	Pro	Leu	Asn	Val	Arg	Gly	Gly	Arg	Asp	Ala	Val	
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65					70					75					80	
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Cys	Met	Leu	Val	Arg	Lys	Val	Ala	Gly	Gly	His	Tyr	Val	Gln	Met	Ala	
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Thr	Pro	Leu	Arg	Asp	Trp	Ala	His	Ala	Gly	Leu	Arg	Asp	Leu	Ala	Val	
145					150				155						160	
gca	gtt	gag	ccc	gtc	gtc	ttc	tct	gat	atg	gag	acc	aag	gtt	atc	acc	2329
Ala	Val	Glu	Pro	Val	Val	Phe	Ser	Asp	Met	Glu	Thr	Lys	Val	Ile	Thr	
			165					170						175		
tgg	ggg	gca	gac	acc	gcg	gcg	tgt	ggg	gac	atc	atc	ttg	ggc	ctg	ccc	2377
Trp	Gly	Ala	Asp	Thr	Ala	Ala	Cys	Gly	Asp	Ile	Ile	Leu	Gly	Leu	Pro	
			180					185					190			
gtc	tcc	gcc	cgc	agg	ggg	agg	gag	ata	cat	ctg	gga	ccg	gca	gac	agc	2425
Val	Ser	Ala	Arg	Arg	Gly	Arg	Glu	Ile	His	Leu	Gly	Pro	Ala	Asp	Ser	
		195					200					205				
ctt	gaa	ggg	cag	ggg	tgg	cga	ctc	ctc	gcg	cct	att	acg	gcc	tac	tcc	2473
Leu	Glu	Gly	Gln	Gly	Trp	Arg	Leu	Leu	Ala	Pro	Ile	Thr	Ala	Tyr	Ser	
	210					215					220					
caa	cag	acg	cga	ggc	cta	ctt	ggc	tgc	atc	atc	act	agc	ctc	aca	ggc	2521
Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly	Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly	
225					230				235						240	
cgg	gac	agg	aac	cag	gtc	gag	ggg	gag	gtc	caa	gtg	gtc	tcc	acc	gca	2569
Arg	Asp	Arg	Asn	Gln	Val	Glu	Gly	Glu	Val	Gln	Val	Val	Ser	Thr	Ala	
				245				250						255		
aca	caa	tct	ttc	ctg	gcg	acc	tgc	gtc	aat	ggc	gtg	tgt	tgg	act	gtc	2617
Thr	Gln	Ser	Phe	Leu	Ala	Thr	Cys	Val	Asn	Gly	Val	Cys	Trp	Thr	Val	
			260					265					270			
tat	cat	ggt	gcc	ggc	tca	aag	acc	ctt	gcc	ggc	cca	aag	ggc	cca	atc	2665
Tyr	His	Gly	Ala	Gly	Ser	Lys	Thr	Leu	Ala	Gly	Pro	Lys	Gly	Pro	Ile	
		275					280					285				

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acc	caa	atg	tac	acc	aat	gtg	gac	cag	gac	ctc	gtc	ggc	tgg	caa	gcg	2713
Thr	Gln	Met	Tyr	Thr	Asn	Val	Asp	Gln	Asp	Leu	Val	Gly	Trp	Gln	Ala	
	290					295					300					
ccc	ccc	ggg	gcg	cgt	tcc	ttg	aca	cca	tgc	acc	tgc	ggc	agc	tcg	gac	2761
Pro	Pro	Gly	Ala	Arg	Ser	Leu	Thr	Pro	Cys	Thr	Cys	Gly	Ser	Ser	Asp	
	305				310					315					320	
ctt	tac	ttg	gtc	acg	aag	cat	gcc	gat	gtc	att	ccg	gtg	cgc	cgg	cgg	2809
Leu	Tyr	Leu	Val	Thr	Lys	His	Ala	Asp	Val	Ile	Pro	Val	Arg	Arg	Arg	
				325					330					335		
ggc	gac	agc	agg	ggg	agc	cta	ctc	tcc	ccc	cgg	ccc	gtc	tcc	tac	ttg	2857
Gly	Asp	Ser	Arg	Gly	Ser	Leu	Leu	Ser	Pro	Arg	Pro	Val	Ser	Tyr	Leu	
			340					345					350			
aag	ggc	tct	tcg	ggc	ggt	cca	ctg	ctc	tgc	ccc	tcg	ggg	cac	gct	gtg	2905
Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu	Leu	Cys	Pro	Ser	Gly	His	Ala	Val	
		355					360					365				
ggc	atc	ttt	cgg	gct	gcc	gtg	tgc	acc	cga	ggg	gtt	gcg	aag	gcg	gtg	2953
Gly	Ile	Phe	Arg	Ala	Ala	Val	Cys	Thr	Arg	Gly	Val	Ala	Lys	Ala	Val	
	370					375					380					
gac	ttt	gta	ccc	gtc	gag	tct	atg	gaa	acc	act	atg	cgg	tcc	ccg	gtc	3001
Asp	Phe	Val	Pro	Val	Glu	Ser	Met	Glu	Thr	Thr	Met	Arg	Ser	Pro	Val	
	385				390					395					400	
ttc	acg	gac	aac	tcg	tcc	cct	ccg	gcc	gta	ccg	cag	aca	ttc	cag	gtg	3049
Phe	Thr	Asp	Asn	Ser	Ser	Pro	Pro	Ala	Val	Pro	Gln	Thr	Phe	Gln	Val	
				405					410					415		
gcc	cat	cta	cac	gcc	cct	act	ggt	agc	ggc	aag	agc	act	aag	gtg	ccg	3097
Ala	His	Leu	His	Ala	Pro	Thr	Gly	Ser	Gly	Lys	Ser	Thr	Lys	Val	Pro	
			420					425					430			
gct	gcg	tat	gca	gcc	caa	ggg	tat	aag	gtg	ctt	gtc	ctg	aac	ccg	tcc	3145
Ala	Ala	Tyr	Ala	Ala	Gln	Gly	Tyr	Lys	Val	Leu	Val	Leu	Asn	Pro	Ser	
		435					440					445				
gtc	gcc	gcc	acc	cta	ggt	ttc	ggg	gcg	tat	atg	tct	aag	gca	cat	ggt	3193
Val	Ala	Ala	Thr	Leu	Gly	Phe	Gly	Ala	Tyr	Met	Ser	Lys	Ala	His	Gly	
	450					455					460					
atc	gac	cct	aac	atc	aga	acc	ggg	gta	agg	acc	atc	acc	acg	ggt	gcc	3241
Ile	Asp	Pro	Asn	Ile	Arg	Thr	Gly	Val	Arg	Thr	Ile	Thr	Thr	Gly	Ala	
	465				470					475					480	
ccc	atc	acg	tac	tcc	acc	tat	ggc	aag	ttt	ctt	gcc	gac	ggt	ggt	tgc	3289
Pro	Ile	Thr	Tyr	Ser	Thr	Tyr	Gly	Lys	Phe	Leu	Ala	Asp	Gly	Gly	Cys	
				485					490					495		
tct	ggg	ggc	gcc	tat	gac	atc	ata	ata	tgt	gat	gag	tgc	cac	tca	act	3337
Ser	Gly	Gly	Ala	Tyr	Asp	Ile	Ile	Ile	Cys	Asp	Glu	Cys	His	Ser	Thr	
			500					505					510			
gac	tcg	acc	act	atc	ctg	ggc	atc	ggc	aca	gtc	ctg	gac	caa	gcg	gag	3385
Asp	Ser	Thr	Thr	Ile	Leu	Gly	Ile	Gly	Thr	Val	Leu	Asp	Gln	Ala	Glu	
		515					520					525				
acg	gct	gga	gcg	cga	ctc	gtc	gtg	ctc	gcc	acc	gct	acg	cct	ccg	gga	3433
Thr	Ala	Gly	Ala	Arg	Leu	Val	Val	Leu	Ala	Thr	Ala	Thr	Pro	Pro	Gly	
	530					535					540					
tcg	gtc	acc	gtg	cca	cat	cca	aac	atc	gag	gag	gtg	gct	ctg	tcc	agc	3481
Ser	Val	Thr	Val	Pro	His	Pro	Asn	Ile	Glu	Glu	Val	Ala	Leu	Ser	Ser	
	545				550					555					560	

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act	gga	gaa	atc	ccc	ttt	tat	ggc	aaa	gcc	atc	ccc	atc	gag	acc	atc	3529
Thr	Gly	Glu	Ile	Pro	Phe	Tyr	Gly	Lys	Ala	Ile	Pro	Ile	Glu	Thr	Ile	
				565					570					575		
aag	ggg	ggg	agg	cac	ctc	att	ttc	tgc	cat	tcc	aag	aag	aaa	tgt	gat	3577
Lys	Gly	Gly	Arg	His	Leu	Ile	Phe	Cys	His	Ser	Lys	Lys	Lys	Cys	Asp	
			580					585					590			
gag	ctc	gcc	gcg	aag	ctg	tcc	ggc	ctc	gga	ctc	aat	gct	gta	gca	tat	3625
Glu	Leu	Ala	Ala	Lys	Leu	Ser	Gly	Leu	Gly	Leu	Asn	Ala	Val	Ala	Tyr	
		595					600					605				
tac	cgg	ggc	ctt	gat	gta	tcc	gtc	ata	cca	act	agc	gga	gac	gtc	att	3673
Tyr	Arg	Gly	Leu	Asp	Val	Ser	Val	Ile	Pro	Thr	Ser	Gly	Asp	Val	Ile	
	610					615					620					
gtc	gta	gca	acg	gac	gct	cta	atg	acg	ggc	ttt	acc	ggc	gat	ttc	gac	3721
Val	Val	Ala	Thr	Asp	Ala	Leu	Met	Thr	Gly	Phe	Thr	Gly	Asp	Phe	Asp	
					630					635					640	
tca	gtg	atc	gac	tgc	aat	aca	tgt	gtc	acc	cag	aca	gtc	gac	ttc	agc	3769
Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys	Val	Thr	Gln	Thr	Val	Asp	Phe	Ser	
				645					650					655		
ctg	gac	ccg	acc	ttc	acc	att	gag	acg	acg	acc	gtg	cca	caa	gac	gcg	3817
Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu	Thr	Thr	Thr	Val	Pro	Gln	Asp	Ala	
			660					665					670			
gtg	tca	cgc	tcg	cag	cgg	cga	ggc	agg	act	ggt	agg	ggc	agg	atg	ggc	3865
Val	Ser	Arg	Ser	Gln	Arg	Arg	Gly	Arg	Thr	Gly	Arg	Gly	Arg	Met	Gly	
		675					680					685				
att	tac	agg	ttt	gtg	act	cca	gga	gaa	cgg	ccc	tcg	ggc	atg	ttc	gat	3913
Ile	Tyr	Arg	Phe	Val	Thr	Pro	Gly	Glu	Arg	Pro	Ser	Gly	Met	Phe	Asp	
	690					695					700					
tcc	tcg	gtt	ctg	tgc	gag	tgc	tat	gac	gcg	ggc	tgt	gct	tgg	tac	gag	3961
Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr	Asp	Ala	Gly	Cys	Ala	Trp	Tyr	Glu	
					710					715					720	
ctc	acg	ccc	gcc	gag	acc	tca	gtt	agg	ttg	cgg	gct	tac	cta	aac	aca	4009
Leu	Thr	Pro	Ala	Glu	Thr	Ser	Val	Arg	Leu	Arg	Ala	Tyr	Leu	Asn	Thr	
				725					730					735		
cca	ggg	ttg	ccc	gtc	tgc	cag	gac	cat	ctg	gag	ttc	tgg	gag	ggc	gtc	4057
Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp	His	Leu	Glu	Phe	Trp	Glu	Gly	Val	
			740					745					750			
ttt	aca	ggc	ctc	acc	cac	ata	gac	gcc	cat	ttc	ttg	tcc	cag	act	aag	4105
Phe	Thr	Gly	Leu	Thr	His	Ile	Asp	Ala	His	Phe	Leu	Ser	Gln	Thr	Lys	
		755					760					765				
cag	gca	gga	gac	aac	ttc	ccc	tac	ctg	gta	gca	tac	cag	gct	acg	gtg	4153
Gln	Ala	Gly	Asp	Asn	Phe	Pro	Tyr	Leu	Val	Ala	Tyr	Gln	Ala	Thr	Val	
	770					775					780					
tgc	gcc	agg	gct	cag	gct	cca	cct	cca	tcg	tgg	gac	caa	atg	tgg	aag	4201
Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro	Pro	Ser	Trp	Asp	Gln	Met	Trp	Lys	
	785				790					795					800	
tgt	ctc	ata	cgg	cta	aag	cct	acg	ctg	cac	ggg	cca	acg	ccc	ctg	ctg	4249
Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr	Leu	His	Gly	Pro	Thr	Pro	Leu	Leu	
				805					810					815		
tat	agg	ctg	gga	gcc	gtt	caa	aac	gag	gtt	act	acc	aca	cac	ccc	ata	4297
Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn	Glu	Val	Thr	Thr	Thr	His	Pro	Ile	
			820					825					830			

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acc	aaa	tac	atc	atg	gca	tgc	atg	tcg	gct	gac	ctg	gag	gtc	gtc	acg	4345
Thr	Lys	Tyr	Ile	Met	Ala	Cys	Met	Ser	Ala	Asp	Leu	Glu	Val	Val	Thr	
		835					840					845				
agc	acc	tgg	gtg	ctg	gta	ggc	gga	gtc	cta	gca	gct	ctg	gcc	gcg	tat	4393
Ser	Thr	Trp	Val	Leu	Val	Gly	Gly	Val	Leu	Ala	Ala	Leu	Ala	Ala	Tyr	
	850					855					860					
tgc	ctg	aca	aca	ggc	agc	gtg	gtc	att	gtg	ggc	agg	atc	atc	ttg	tcc	4441
Cys	Leu	Thr	Thr	Gly	Ser	Val	Val	Ile	Val	Gly	Arg	Ile	Ile	Leu	Ser	
865					870					875					880	
gga	agg	ccg	gcc	atc	att	ccc	gac	agg	gaa	gtc	ctt	tac	cgg	gag	ttc	4489
Gly	Arg	Pro	Ala	Ile	Ile	Pro	Asp	Arg	Glu	Val	Leu	Tyr	Arg	Glu	Phe	
				885					890					895		
gat	gag	atg	gaa	gag	tgc	gcc	tca	cac	ctc	cct	tac	atc	gaa	cag	gga	4537
Asp	Glu	Met	Glu	Glu	Cys	Ala	Ser	His	Leu	Pro	Tyr	Ile	Glu	Gln	Gly	
			900					905					910			
atg	cag	ctc	gcc	gaa	caa	ttc	aaa	cag	aag	gca	atc	ggg	ttg	ctg	caa	4585
Met	Gln	Leu	Ala	Glu	Gln	Phe	Lys	Gln	Lys	Ala	Ile	Gly	Leu	Leu	Gln	
		915					920					925				
aca	gcc	acc	aag	caa	gcg	gag	gct	gct	gct	ccc	gtg	gtg	gaa	tcc	aag	4633
Thr	Ala	Thr	Lys	Gln	Ala	Glu	Ala	Ala	Ala	Pro	Val	Val	Glu	Ser	Lys	
	930					935					940					
tgg	cgg	acc	ctc	gaa	gcc	ttc	tgg	gcg	aag	cat	atg	tgg	aat	ttc	atc	4681
Trp	Arg	Thr	Leu	Glu	Ala	Phe	Trp	Ala	Lys	His	Met	Trp	Asn	Phe	Ile	
945					950					955					960	
agc	ggg	ata	caa	tat	tta	gca	ggc	ttg	tcc	act	ctg	cct	ggc	aac	ccc	4729
Ser	Gly	Ile	Gln	Tyr	Leu	Ala	Gly	Leu	Ser	Thr	Leu	Pro	Gly	Asn	Pro	
				965					970					975		
gcg	ata	gca	tca	ctg	atg	gca	ttc	aca	gcc	tct	atc	acc	agc	ccg	ctc	4777
Ala	Ile	Ala	Ser	Leu	Met	Ala	Phe	Thr	Ala	Ser	Ile	Thr	Ser	Pro	Leu	
			980					985					990			
acc	acc	caa	cat	acc	ctc	ctg	ttt	aac	atc	ctg	ggg	gga	tgg	gtg	gcc	4825
Thr	Thr	Gln	His	Thr	Leu	Leu	Phe	Asn	Ile	Leu	Gly	Gly	Trp	Val	Ala	
		995					1000					1005				
gcc	caa	ctt	gct	cct	ccc	agc	gct	gct	tcc	gct	ttc	gta	ggc	gcc	ggc	4873
Ala	Gln	Leu	Ala	Pro	Pro	Ser	Ala	Ala	Ser	Ala	Phe	Val	Gly	Ala	Gly	
	1010					1015					1020					
atc	gct	gga	gcg	gct	gtt	ggc	agc	ata	ggc	ctt	ggg	aag	gtg	ctt	gtg	4921
Ile	Ala	Gly	Ala	Ala	Val	Gly	Ser	Ile	Gly	Leu	Gly	Lys	Val	Leu	Val	
1025					1030					1035					1040	
gat	att	ttg	gca	ggt	tat	gga	gca	ggg	gtg	gca	ggc	gcg	ctc	gtg	gcc	4969
Asp	Ile	Leu	Ala	Gly	Tyr	Gly	Ala	Gly	Val	Ala	Gly	Ala	Leu	Val	Ala	
				1045					1050					1055		
ttt	aag	gtc	atg	agc	ggc	gag	atg	ccc	tcc	acc	gag	gac	ctg	gtt	aac	5017
Phe	Lys	Val	Met	Ser	Gly	Glu	Met	Pro	Ser	Thr	Glu	Asp	Leu	Val	Asn	
			1060					1065					1070			
cta	ctc	cct	gct	atc	ctc	tcc	cct	ggc	gcc	cta	gtc	gtc	ggg	gtc	gtg	5065
Leu	Leu	Pro	Ala	Ile	Leu	Ser	Pro	Gly	Ala	Leu	Val	Val	Gly	Val	Val	
		1075					1080					1085				
tgc	gca	gcg	ata	ctg	cgt	cgg	cac	gtg	ggc	cca	ggg	gag	ggg	gct	gtg	5113
Cys	Ala	Ala	Ile	Leu	Arg	Arg	His	Val	Gly	Pro	Gly	Glu	Gly	Ala	Val	
	1090					1095					1100					

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cag tgg atg aac cgg ctg ata gcg ttc gct tcg cgg ggt aac cac gtc Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val 1105 1110 1115 1120	5161
tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr 1125 1130 1135	5209
cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His 1140 1145 1150	5257
cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu 1155 1160 1165	5305
aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag gcc Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Ala 1170 1175 1180	5353
tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe 1185 1190 1195 1200	5401
tca tgt caa cgt ggg tac aag gga gtc tgg cgg ggc gac ggc atc atg Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met 1205 1210 1215	5449
caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn 1220 1225 1230	5497
tgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His 1235 1240 1245	5545
gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser 1250 1255 1260	5593
ccg gcg cca aat tat tct agg gcg ctg tgg cgg gtg gct gct gag gag Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu 1265 1270 1275 1280	5641
tac gtg gag gtt acg cga gtg ggg gat ttc cac tac gtg acg ggc atg Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met 1285 1290 1295	5689
acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe 1300 1305 1310	5737
ttc aca gaa gtg gat ggg gtg cgg ttg cac agg tac gct cca gcg tgc Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys 1315 1320 1325	5785
aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln 1330 1335 1340	5833
tac ctg gtt ggg tca cag ctc cca tgc gag ccc gaa ctg gac gta gca Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Leu Asp Val Ala 1345 1350 1355 1360	5881
gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr 1365 1370 1375	5929

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gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser 1380 1385 1390	5977
tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr 1395 1400 1405	6025
cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp 1410 1415 1420	6073
cgg cag gag atg ggc ggg aac atc acc cgc gtg gag tca gaa aat aag Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys 1425 1430 1435 1440	6121
gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu 1445 1450 1455	6169
agg gaa gta tcc gtt ccg gcg gag atc ctg cgg agg tcc agg aaa ttc Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe 1460 1465 1470	6217
cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu 1475 1480 1485	6265
ttg gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly 1490 1495 1500	6313
tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca cgg agg Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg 1505 1510 1515 1520	6361
aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala 1525 1530 1535	6409
gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp 1540 1545 1550	6457
agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp 1555 1560 1565	6505
gcg gga tcc gac gtt gag tcg tac tcc tcc atg ccc ccc ctt gag ggg Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly 1570 1575 1580	6553
gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser 1585 1590 1595 1600	6601
gag gag gct agt gag gac gtc gtc tgc tgc tcg atg tcc tac aca tgg Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp 1605 1610 1615	6649
acg ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro 1620 1625 1630	6697
atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr 1635 1640 1645	6745

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gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe 1650 1655 1660	6793
gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu 1665 1670 1675 1680	6841
atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu 1685 1690 1695	6889
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly 1700 1705 1710	6937
tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His 1715 1720 1725	6985
atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile 1730 1735 1740	7033
gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu 1745 1750 1755 1760	7081
aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly 1765 1770 1775	7129
gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu 1780 1785 1790	7177
cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly 1795 1800 1805	7225
cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro 1810 1815 1820	7273
atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu 1825 1830 1835 1840	7321
aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala 1845 1850 1855	7369
ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile 1860 1865 1870	7417
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tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr 1890 1895 1900	7513
tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac Cys Tyr Leu Lys Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp 1905 1910 1915 1920	7561

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tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc	7609
Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser	
1925 1930 1935	
gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct	7657
Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala	
1940 1945 1950	
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Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr	
1955 1960 1965	
gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac	7753
Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His	
1970 1975 1980	
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Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr	
1985 1990 2000	
ccc ctt gcg cgg gct gcg tgg gag aca gct aga cac act cca gtc aat	7849
Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn	
2005 2010 2015	
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Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg	
2020 2025 2030	
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Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln	
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Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile	
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Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser	
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Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala	
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Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His	
2100 2105 2110	
cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct	8185
Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala	
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Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu	
2130 2135 2140	
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Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp	
2145 2150 2155 2160	
ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt	8329
Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg	
2165 2170 2175	
gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg	8377
Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Leu Ser Val Gly	
2180 2185 2190	

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Val Gly Ile Tyr Leu Leu Pro Asn Arg *
2195 2200

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<213> HCV

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<222> (1802)...(8407)

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ccccctctcc gggagagcca tagtggctcg cggaaccggt gaggacaccg gaattgccag 180
gacgaccggg tcctttcttg gatcaacccg ctcaatgcct ggagatttgg gcgtgcccc 240
gcgagactgc tagccgagta gtgttggtgc gcgaaaggcc ttgtggtact gcctgatagg 300
gtgcttgcca gtgccccggg aggtctcgtg gaccgtgcac catgagcacg aatcctaaac 360
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c atg gac cgg gag atg gca gca tgc tgc gga ggc gcg gtt ttc gta ggt 1849
Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Val Gly
1 5 10 15

ctg ata ctc ttg acc ttg tca ccg cac tat aag ctg ttc ctc gct agg 1897
Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala Arg
20 25 30

ctc ata tgg tgg tta caa tat ttt atc acc agg gcc gag gca cac ttg 1945
Leu Ile Trp Trp Leu Gln Tyr Phe Ile Thr Arg Ala Glu Ala His Leu
35 40 45

caa gtg tgg atc ccc ccc ctc aac gtt cgg ggg ggc cgc gat gcc gtc 1993
Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val
50 55 60

atc ctc ctc acg tgc gcg atc cac cca gag cta atc ttt acc atc acc 2041
Ile Leu Leu Thr Cys Ala Ile His Pro Glu Leu Ile Phe Thr Ile Thr
Page 32

65	70	75	80	
aaa atc ttg ctc gcc ata ctc ggt cca ctc atg gtg ctc cag gct ggt	85	90	95	2089
Lys Ile Leu Leu Ala Ile Leu Gly Pro Leu Met Val Leu Gln Ala Gly				
ata acc aaa gtg ccg tac ttc gtg cgc gca cac ggg ctc att cgt gca	100	105	110	2137
Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg Ala				
tgc atg ctg gtg cgg aag gtt gct ggg ggt cat tat gtc caa atg gct	115	120	125	2185
Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met Ala				
ctc atg aag ttg gcc gca ctg aca ggt acg tac gtt tat gac cat ctc	130	135	140	2233
Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu				
acc cca ctg cgg gac tgg gcc cac gcg ggc cta cga gac ctt gcg gtg	145	150	155	2281
Thr Pro Leu Arg Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val				
gca gtt gag ccc gtc gtc ttc tct gat atg gag acc aag gtt atc acc	165	170	175	2329
Ala Val Glu Pro Val Phe Ser Asp Met Glu Thr Lys Val Ile Thr				
tgg ggg gca gac acc gcg gcg tgt ggg gac atc atc ttg ggc ctg ccc	180	185	190	2377
Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Leu Gly Leu Pro				
gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac agc	195	200	205	2425
Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser				
ctt gaa ggg cag ggg tgg cga ctc ctc gcg cct att acg gcc tac tcc	210	215	220	2473
Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser				
caa cag acg cga ggc cta ctt ggc tgc atc atc act agc ctc aca ggc	225	230	235	2521
Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly				
cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca	245	250	255	2569
Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala				
aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc	260	265	270	2617
Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val				
tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc	275	280	285	2665
Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile				
acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg	290	295	300	2713
Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala				
ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac	305	310	315	2761
Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp				
ctt tac ttg gtc acg agg cat gcc gat gtc att ccg gtg cgc cgg cgg	325	330	335	2809
Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg				
ggc gac agc agg ggg agc cta ctc tcc ccc agg ccc gtc tcc tac ttg				2857
Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu				

340		345		350		
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Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val						
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Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val						
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Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val						
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Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro						
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Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser						
gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat ggt	3193					
Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly						
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Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala						
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Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser Thr						
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Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp						
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Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr						
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Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile						

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cag gca gga gac aac ttc ccc tac ctg gta gca tac cag gct acg gtg 4153 Gln Ala Gly Asp Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val 770 775 780			
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Thr	Ala	Thr	Lys	Gln	Ala	Glu	Ala	Ala	Ala	Pro	Val	Val	Glu	Ser	Lys	
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Ser	Gly	Ile	Gln	Tyr	Leu	Ala	Gly	Leu	Ser	Thr	Leu	Pro	Gly	Asn	Pro	
				965					970					975		
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Ala	Ile	Ala	Ser	Leu	Met	Ala	Phe	Thr	Ala	Ser	Ile	Thr	Ser	Pro	Leu	
			980					985					990			
acc	acc	caa	cat	acc	ctc	ctg	ttt	aac	atc	ctg	ggg	gga	tgg	gtg	gcc	4825
Thr	Thr	Gln	His	Thr	Leu	Leu	Phe	Asn	Ile	Leu	Gly	Gly	Trp	Val	Ala	
		995					1000					1005				
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Ala	Gln	Leu	Ala	Pro	Pro	Ser	Ala	Ala	Ser	Ala	Phe	Val	Gly	Ala	Gly	
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Ile	Ala	Gly	Ala	Ala	Val	Gly	Ser	Ile	Gly	Leu	Gly	Lys	Val	Leu	Val	
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Asp	Ile	Leu	Ala	Gly	Tyr	Gly	Ala	Gly	Val	Ala	Gly	Ala	Leu	Val	Ala	
				1045					1050					1055		
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Phe	Lys	Val	Met	Ser	Gly	Glu	Met	Pro	Ser	Thr	Glu	Asp	Leu	Val	Asn	
			1060					1065					1070			
cta	ctc	cct	gct	atc	ctc	tcc	cct	ggc	gcc	cta	gtc	gtc	ggg	gtc	gtg	5065
Leu	Leu	Pro	Ala	Ile	Leu	Ser	Pro	Gly	Ala	Leu	Val	Val	Gly	Val	Val	
		1075					1080					1085				
tgc	gca	gcg	ata	ctg	cgt	cgg	cac	gtg	ggc	cca	ggg	gag	ggg	gct	gtg	5113
Cys	Ala	Ala	Ile	Leu	Arg	Arg	His	Val	Gly	Pro	Gly	Glu	Gly	Ala	Val	
	1090					1095					1100					
cag	tgg	atg	aac	cgg	ctg	ata	gcg	ttc	gct	tgc	cgg	ggt	aac	cac	gtc	5161
Gln	Trp	Met	Asn	Arg	Leu	Ile	Ala	Phe	Ala	Ser	Arg	Gly	Asn	His	Val	
	1105				1110					1115					1120	
tcc	ccc	acg	cac	tat	gtg	cct	gag	agc	gac	gct	gca	gca	cgt	gtc	act	5209
Ser	Pro	Thr	His	Tyr	Val	Pro	Glu	Ser	Asp	Ala	Ala	Ala	Arg	Val	Thr	
				1125					1130					1135		
cag	atc	ctc	tct	agt	ctt	acc	atc	act	cag	ctg	ctg	aag	agg	ctt	cac	5257
Gln	Ile	Leu	Ser	Ser	Leu	Thr	Ile	Thr	Gln	Leu	Leu	Lys	Arg	Leu	His	
			1140					1145					1150			
cag	tgg	atc	aac	gag	gac	tgc	tcc	acg	cca	tgc	tcc	ggc	tgc	tgg	cta	5305
Gln	Trp	Ile	Asn	Glu	Asp	Cys	Ser	Thr	Pro	Cys	Ser	Gly	Ser	Trp	Leu	

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1155	1160	1165	
aga gat gtt tgg gat tgg gta tgc acg gtg ttg act gat ttc aag acc Arg Asp Val Trp Asp Trp Val Cys Thr Val Leu Thr Asp Phe Lys Thr 1170 1175 1180			5353
tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe 1185 1190 1195 1200			5401
tca tgt caa cgt ggg tac aag gga gtc ttg ccg ggc gac ggc atc atg Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met 1205 1210 1215			5449
caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn 1220 1225 1230			5497
tgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His 1235 1240 1245			5545
gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser 1250 1255 1260			5593
ccg gcg cca aat tat tct agg gcg ctg ttg ccg gtg gct gct gag gag Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu 1265 1270 1275 1280			5641
tac gtg gag gtt acg cgg gtg ggg gat ttc cac tac gtg acg ggc atg Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met 1285 1290 1295			5689
acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe 1300 1305 1310			5737
ttc aca gaa gtg gat ggg gtg ccg ttg cac agg tac gct cca gcg tgc Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys 1315 1320 1325			5785
aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln 1330 1335 1340			5833
tac ctg gtt ggg tca cag ctc cca tgc gag ccc gaa ccg gac gta gca Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala 1345 1350 1355 1360			5881
gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr 1365 1370 1375			5929
gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser 1380 1385 1390			5977
tca gct agc cag ctg tct gcg ccc tcc ttg aag gca aca tgc act acc Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr 1395 1400 1405			6025
cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp 1410 1415 1420			6073
cgg cag gag atg ggc ggg aac atc acc cgc gtg gag tca gaa aat aag Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys 1425 1430 1435			6121

1425	1430	1435	1440		
gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag	Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu	1445	1450	1455	6169
agg gaa gta tcc gtt ccg gcg gag atc ctg ccg agg tcc agg aaa ttc	Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe	1460	1465	1470	6217
cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg	Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu	1475	1480	1485	6265
tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg	Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly	1490	1495	1500	6313
tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca cgg agg	Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg	1505	1510	1515	6361
aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg	Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala	1525	1530	1535	6409
gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac	Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp	1540	1545	1550	6457
agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac	Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp	1555	1560	1565	6505
gcg gga tcc gac gtt gag tcg tac tcc tcc atg ccc ccc ctt gag ggg	Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly	1570	1575	1580	6553
gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc	Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser	1585	1590	1595	6601
gag gag gct agt gag gac gtc gtc tgc tgc tcg atg tcc tac aca tgg	Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp	1605	1610	1615	6649
aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc	Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro	1620	1625	1630	6697
atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat	Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr	1635	1640	1645	6745
gct aca aca tct cgc agc gca agc ctg ccg cag aag aag gtc acc ttt	Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe	1650	1655	1660	6793
gac aga ctg cag gtc ctg gac gac cac tac ccg gac gtg ctc aag gag	Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu	1665	1670	1675	6841
atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag	Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu	1685	1690	1695	6889
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc	Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly				6937

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1700	1705	1710	
tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac			6985
Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His			
1715	1720	1725	
atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att			7033
Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile			
1730	1735	1740	
gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag			7081
Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu			
1745	1750	1755	1760
aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg			7129
Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly			
1765	1770	1775	
gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc			7177
Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu			
1780	1785	1790	
cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga			7225
Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly			
1795	1800	1805	
cag cgg gtc gag ttc ctg gtg aat gct tgg aaa gcg aag aaa tgc cct			7273
Gln Arg Val Glu Phe Leu Leu Asn Ala Trp Lys Ala Lys Lys Cys Pro			
1810	1815	1820	
atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag			7321
Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu			
1825	1830	1835	1840
aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc			7369
Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala			
1845	1850	1855	
ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc			7417
Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile			
1860	1865	1870	
ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg			7465
Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg			
1875	1880	1885	
tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca			7513
Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr			
1890	1895	1900	
tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac			7561
Cys Tyr Leu Lys Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp			
1905	1910	1915	1920
tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc			7609
Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser			
1925	1930	1935	
gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct			7657
Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala			
1940	1945	1950	
atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa tac			7705
Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr			
1955	1960	1965	
gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac			7753
Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His			

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1970

1975

1980

gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc	7801
Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr	
1985 1990 1995 2000	
ccc ctt gcg cgg gct gcg tgg gag aca gct aga cac act cca gtc aat	7849
Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn	
2005 2010 2015	
tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg	7897
Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg	
2020 2025 2030	
atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa	7945
Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln	
2035 2040 2045	
ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att	7993
Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile	
2050 2055 2060	
gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc	8041
Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser	
2065 2070 2075	
gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct	8089
Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala	
2085 2090 2095	
tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat	8137
Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His	
2100 2105 2110	
cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct	8185
Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala	
2115 2120 2125	
gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc	8233
Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu	
2130 2135 2140	
aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg	8281
Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp	
2145 2150 2155 2160	
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Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg	
2165 2170 2175	
gcc cga ccc cgc tgg ttc acg tgg tgc cta ctc cta ctt tct gta ggg	8377
Ala Arg Pro Arg Trp Phe Thr Trp Cys Leu Leu Leu Leu Ser Val Gly	
2180 2185 2190	
gta ggc atc tat cta ctc ccc aac cga tga acg ggg agct aaacactcca	8427
Val Gly Ile Tyr Leu Leu Pro Asn Arg *	
2195 2200	
ggccaatagg ccatacctggt tttttccctt ttttcccttt tttttttttt tttttttttt	8487
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<220>

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<222> (1802)...(8407)

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c atg gac cgg gag atg gca gca tcg tgc gga ggc gcg gtt ttc gta ggt 1849
Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Val Gly
1 5 10 15

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ctg ata ctc ttg acc ttg tca ccg cac tat aag ctg ttc ctc gct agg 1897
Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala Arg
20 25 30

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```

ctc ata tgg tgg tta caa tat ttt atc acc agg gcc gag gca cac ttg 1945
Leu Ile Trp Trp Leu Gln Tyr Phe Ile Thr Arg Ala Glu Ala His Leu
35 40 45

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caa gtg tgg atc ccc ccc ctc aac gtt cgg ggg ggc cgc gat gcc gtc 1993
Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val
50 55 60

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atc ctc ctc acg tgc gcg atc cac cca gag cta atc ttt acc atc acc 2041
Ile Leu Leu Thr Cys Ala Ile His Pro Glu Leu Ile Phe Thr Ile Thr
65 70 75 80

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aaa atc ttg ctc gcc ata ctc ggt cca ctc atg gtg ctc cag gct ggt 2089
Lys Ile Leu Leu Ala Ile Leu Gly Pro Leu Met Val Leu Gln Ala Gly
85 90 95

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ata acc aaa gtg ccg tac ttc gtg cgc gca cac ggg ctc att cgt gca 2137
Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg Ala
100 105 110

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tgc atg ctg gtg cgg aag gtt gct ggg ggt cat tat gtc caa atg gct 2185
Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met Ala
115 120 125

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ctc atg aag ttg gcc gca ctg aca ggt acg tac gtt tat gac cat ctc 2233

```

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acc	cca	ctg	cgg	gac	tgg	gcc	cac	gcg	ggc	cta	cga	gac	ctt	gcg	gtg	2281
Thr	Pro	Leu	Arg	Asp	Trp	Ala	His	Ala	Gly	Leu	Arg	Asp	Leu	Ala	Val	
145					150					155					160	
gca	gtt	gag	ccc	gtc	gtc	ttc	tct	gat	atg	gag	acc	aag	gtt	atc	acc	2329
Ala	Val	Glu	Pro	Val	Val	Phe	Ser	Asp	Met	Glu	Thr	Lys	Val	Ile	Thr	
				165					170					175		
tgg	ggg	gca	gac	acc	gcg	gcg	tgt	ggg	gac	atc	atc	ttg	ggc	ctg	ccc	2377
Trp	Gly	Ala	Asp	Thr	Ala	Ala	Cys	Gly	Asp	Ile	Ile	Leu	Gly	Leu	Pro	
			180					185					190			
gtc	tcc	gcc	cgc	agg	ggg	agg	gag	ata	cat	ctg	gga	ccg	gca	gac	agc	2425
Val	Ser	Ala	Arg	Arg	Gly	Arg	Glu	Ile	His	Leu	Gly	Pro	Ala	Asp	Ser	
		195					200					205				
ctt	gaa	ggg	cag	ggg	tgg	cga	ctc	ctc	gcg	cct	att	acg	gcc	tac	tcc	2473
Leu	Glu	Gly	Gln	Gly	Trp	Arg	Leu	Leu	Ala	Pro	Ile	Thr	Ala	Tyr	Ser	
	210					215					220					
caa	cag	acg	cga	ggc	cta	ctt	ggc	tgc	atc	atc	act	agc	ctc	aca	ggc	2521
Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly	Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly	
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cgg	gac	agg	aac	cag	gtc	gag	ggg	gag	gtc	caa	gtg	gtc	tcc	acc	gca	2569
Arg	Asp	Arg	Asn	Gln	Val	Glu	Gly	Glu	Val	Gln	Val	Val	Ser	Thr	Ala	
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aca	caa	tct	ttc	ctg	gcg	acc	tgc	gtc	aat	ggc	gtg	tgt	tgg	act	gtc	2617
Thr	Gln	Ser	Phe	Leu	Ala	Thr	Cys	Val	Asn	Gly	Val	Cys	Trp	Thr	Val	
			260					265					270			
tat	cat	ggt	gcc	ggc	tca	aag	acc	ctt	gcc	ggc	cca	aag	ggc	cca	atc	2665
Tyr	His	Gly	Ala	Gly	Ser	Lys	Thr	Leu	Ala	Gly	Pro	Lys	Gly	Pro	Ile	
		275					280					285				
acc	caa	atg	tac	acc	aat	gtg	gac	cag	gac	ctc	gtc	ggc	tgg	caa	gcg	2713
Thr	Gln	Met	Tyr	Thr	Asn	Val	Asp	Gln	Asp	Leu	Val	Gly	Trp	Gln	Ala	
	290					295					300					
ccc	ccc	ggg	gcg	cgt	tcc	ttg	aca	cca	tgc	acc	tgc	ggc	agc	tcg	gac	2761
Pro	Pro	Gly	Ala	Arg	Ser	Leu	Thr	Pro	Cys	Thr	Cys	Gly	Ser	Ser	Asp	
305					310					315					320	
ctt	tac	ttg	gtc	acg	agg	cat	gcc	gat	gtc	att	ccg	gtg	cgc	cgg	cgg	2809
Leu	Tyr	Leu	Val	Thr	Arg	His	Ala	Asp	Val	Ile	Pro	Val	Arg	Arg	Arg	
				325					330					335		
ggc	gac	ggc	agg	ggg	agc	cta	ctc	tcc	ccc	agg	ccc	gtc	tcc	tac	ttg	2857
Gly	Asp	Gly	Arg	Gly	Ser	Leu	Leu	Ser	Pro	Arg	Pro	Val	Ser	Tyr	Leu	
			340					345					350			
aag	ggc	tct	tcg	ggc	ggg	cca	ctg	ctc	tgc	ccc	tcg	ggg	cac	gct	gtg	2905
Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu	Leu	Cys	Pro	Ser	Gly	His	Ala	Val	
		355					360					365				
ggc	atc	ttt	cgg	gct	gcc	gtg	tgc	acc	cga	ggg	gtt	gcg	aag	gcg	gtg	2953
Gly	Ile	Phe	Arg	Ala	Ala	Val	Cys	Thr	Arg	Gly	Val	Ala	Lys	Ala	Val	
	370					375					380					
gac	ttt	gta	ccc	gtc	gag	tct	atg	gga	acc	act	atg	cgg	tcc	ccg	gtc	3001
Asp	Phe	Val	Pro	Val	Glu	Ser	Met	Gly	Thr	Thr	Met	Arg	Ser	Pro	Val	
					390					395					400	
ttc	acg	gac	aac	tcg	tcc	cct	ccg	gcc	gta	ccg	cag	aca	ttc	cag	gtg	3049

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Phe	Thr	Asp	Asn	Ser 405	Ser	Pro	Pro	Ala	Val 410	Pro	Gln	Thr	Phe	Gln 415	Val		
gcc	cat	cta	cac	gcc	cct	act	ggt	agc	ggc	aag	agc	act	aag	gtg	ccg	3097	
Ala	His	Leu	His 420	Ala	Pro	Thr	Gly	Ser 425	Gly	Lys	Ser	Thr	Lys 430	Val	Pro		
gct	gcg	tat	gca	gcc	caa	ggg	tat	aag	gtg	ctt	gtc	ctg	aac	ccg	tcc	3145	
Ala	Ala	Tyr 435	Ala	Ala	Gln	Gly	Tyr 440	Lys	Val	Leu	Val	Leu 445	Asn	Pro	Ser		
gtc	gcc	gcc	acc	cta	ggt	ttc	ggg	gcg	tat	atg	tct	aag	gca	cat	ggt	3193	
Val	Ala 450	Ala	Thr	Leu	Gly	Phe 455	Gly	Ala	Tyr	Met	Ser 460	Lys	Ala	His	Gly		
atc	gac	cct	aac	atc	aga	acc	ggg	gta	agg	acc	atc	acc	acg	ggt	gcc	3241	
Ile 465	Asp	Pro	Asn	Ile	Arg 470	Thr	Gly	Val	Arg	Thr 475	Ile	Thr	Thr	Gly	Ala 480		
ccc	atc	acg	tac	tcc	acc	tat	ggc	aag	ttt	ctt	gcc	gac	ggt	ggt	tgc	3289	
Pro	Ile	Thr	Tyr	Ser 485	Thr	Tyr	Gly	Lys	Phe 490	Leu	Ala	Asp	Gly	Gly 495	Cys		
tct	ggg	ggc	gcc	tat	gac	atc	ata	ata	tgt	gat	gag	tgc	cac	tca	act	3337	
Ser	Gly	Gly	Ala 500	Tyr	Asp	Ile	Ile	Ile 505	Cys	Asp	Glu	Cys	His 510	Ser	Thr		
gac	tcg	acc	act	atc	ctg	ggc	atc	ggc	aca	gtc	ctg	gac	caa	gcg	gag	3385	
Asp	Ser	Thr 515	Thr	Ile	Leu	Gly	Ile 520	Gly	Thr	Val	Leu	Asp 525	Gln	Ala	Glu		
acg	gct	gga	gcg	cga	ctc	gtc	gtg	ctc	gcc	acc	gct	acg	cct	ccg	gga	3433	
Thr	Ala 530	Gly	Ala	Arg	Leu	Val 535	Val	Leu	Ala	Thr	Ala 540	Thr	Pro	Pro	Gly		
tcg	gtc	acc	gtg	cca	cat	cca	aac	atc	gag	gag	gtg	gct	ctg	tcc	agc	3481	
Ser 545	Val	Thr	Val	Pro	His 550	Pro	Asn	Ile	Glu	Glu 555	Val	Ala	Leu	Ser	Ser 560		
act	gga	gaa	atc	ccc	ttt	tat	ggc	aaa	gcc	atc	ccc	atc	gag	acc	atc	3529	
Thr	Gly	Glu	Ile	Pro 565	Phe	Tyr	Gly	Lys	Ala 570	Ile	Pro	Ile	Glu	Thr 575	Ile		
aag	ggg	ggg	agg	cac	ctc	att	ttc	tgc	cat	tcc	aag	aag	aaa	tgt	gat	3577	
Lys	Gly	Gly	Arg 580	His	Leu	Ile	Phe	Cys 585	His	Ser	Lys	Lys	Lys 590	Cys	Asp		
gag	ctc	gcc	gcg	aag	ctg	tcc	ggc	ctc	gga	ctc	aat	gct	gta	gca	tat	3625	
Glu	Leu	Ala 595	Ala	Lys	Leu	Ser	Gly 600	Leu	Gly	Leu	Asn	Ala 605	Val	Ala	Tyr		
tac	cgg	ggc	ctt	gat	gta	tcc	gtc	ata	cca	act	agc	gga	gac	gtc	att	3673	
Tyr	Arg 610	Gly	Leu	Asp	Val	Ser 615	Val	Ile	Pro	Thr	Ser 620	Gly	Asp	Val	Ile		
gtc	gta	gca	acg	gac	gct	cta	atg	acg	ggc	ttt	acc	ggc	gat	ttc	gac	3721	
Val 625	Val	Ala	Thr	Asp	Ala 630	Leu	Met	Thr	Gly	Phe 635	Thr	Gly	Asp	Phe	Asp 640		
tca	gtg	atc	gac	tgc	aat	aca	tgt	gtc	acc	cag	aca	gtc	gac	ttc	agc	3769	
Ser	Val	Ile	Asp	Cys 645	Asn	Thr	Cys	Val	Thr 650	Gln	Thr	Val	Asp	Phe 655	Ser		
ctg	gac	ccg	acc	ttc	acc	att	gag	acg	acg	acc	gtg	cca	caa	gac	gcg	3817	
Leu	Asp	Pro	Thr 660	Phe	Thr	Ile	Glu	Thr 665	Thr	Thr	Val	Pro	Gln 670	Asp	Ala		
gtg	tca	cgc	tcg	cag	cgg	cga	ggc	agg	act	ggt	agg	ggc	agg	atg	ggc	3865	

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Val	Ser	Arg 675	Ser	Gln	Arg	Arg	Gly 680	Arg	Thr	Gly	Arg	Gly 685	Arg	Met	Gly	
att Ile	tac Tyr 690	agg Arg	ttt Phe	gtg Val	act Thr	cca Pro 695	gga Gly	gaa Glu	cgg Arg	ccc Pro	tcg Ser 700	ggc Gly	atg Met	ttc Phe	gat Asp	3913
tcc Ser 705	tcg Ser	gtt Val	ctg Leu	tgc Cys	gag Glu 710	tgc Cys	tat Tyr	gac Asp	gcg Ala	ggc Gly 715	tgt Cys	gct Ala	tgg Trp	tac Tyr	gag Glu 720	3961
ctc Leu	acg Thr	ccc Pro	gcc Ala	gag Glu 725	acc Thr	tca Ser	gtt Val	agg Arg	ttg Leu 730	cgg Arg	gct Ala	tac Tyr	cta Leu	aac Asn 735	aca Thr	4009
cca Pro	ggg Gly	ttg Leu	ccc Pro 740	gtc Val	tgc Cys	cag Gln	gac Asp	cat His 745	ctg Leu	gag Glu	ttc Phe	tgg Trp	gag Glu 750	agc Ser	gtc Val	4057
ttt Phe	aca Thr	ggc Gly 755	ctc Leu	acc Thr	cac His	ata Ile	gac Asp 760	gcc Ala	cat His	ttc Phe	ttg Leu	tcc Ser 765	cag Gln	act Thr	aag Lys	4105
cag Gln	gca Ala 770	gga Gly	gac Asp	aac Asn	ttc Phe	ccc Pro 775	tac Tyr	ctg Leu	gta Val	gca Ala	tac Tyr 780	cag Gln	gct Ala	acg Thr	gtg Val	4153
tgc Cys 785	gcc Ala	agg Arg	gct Ala	cag Gln	gct Ala 790	cca Pro	cct Pro	cca Pro	tcg Ser	tgg Trp 795	gac Asp	caa Gln	atg Met	tgg Trp	aag Lys 800	4201
tgt Cys	ctc Leu	ata Ile	cgg Arg	cta Leu 805	aag Lys	cct Pro	acg Thr	ctg Leu	cac His 810	ggg Gly	cca Pro	acg Thr	ccc Pro	ctg Leu 815	ctg Leu	4249
tat Tyr	agg Arg	ctg Leu	gga Gly 820	gcc Ala	gtt Val	caa Gln	aac Asn	gag Glu 825	gtt Val	act Thr	acc Thr	aca Thr	cac His 830	ccc Pro	ata Ile	4297
acc Thr	aaa Lys	tac Tyr 835	atc Ile	atg Met	gca Ala	tgc Cys	atg Met 840	tcg Ser	gct Ala	gac Asp	ctg Leu	gag Glu 845	gtc Val	gtc Val	acg Thr	4345
agc Ser	acc Thr 850	tgg Trp	gtg Val	ctg Leu	gta Val	ggc Gly 855	gga Gly	gtc Val	cta Leu	gca Ala	gct Ala 860	ctg Leu	gcc Ala	gcg Ala	tat Tyr	4393
tgc Cys 865	ctg Leu	aca Thr	aca Thr	ggc Gly	agc Ser 870	gtg Val	gtc Val	att Ile	gtg Val	ggc Gly 875	agg Arg	atc Ile	atc Ile	ttg Leu	tcc Ser 880	4441
gga Gly	aag Lys	ccg Pro	gcc Ala	atc Ile 885	att Ile	ccc Pro	gac Asp	agg Arg	gaa Glu 890	gtc Val	ttt Phe	tac Tyr	cgg Arg	gag Glu 895	ttc Phe	4489
gat Asp	gag Glu	atg Met	gaa Glu 900	gag Glu	tgc Cys	gcc Ala	tca Ser	cac His 905	ctc Leu	cct Pro	tac Tyr	atc Ile	gaa Glu 910	cag Gln	gga Gly	4537
atg Met	cag Gln	ctc Leu 915	gcc Ala	gaa Glu	caa Gln	ttc Phe	aaa Lys 920	cag Gln	aag Lys	gca Ala	atc Ile	ggg Gly 925	ttg Leu	ctg Leu	caa Gln	4585
aca Thr	gcc Ala 930	acc Thr	aag Lys	caa Gln	gcg Ala	gag Glu 935	gct Ala	gct Ala	gct Ala	ccc Pro	gtg Val 940	gtg Val	gaa Glu	tcc Ser	aag Lys	4633
tgg	cgg	acc	ctc	gaa	gcc	ttc	tgg	gcg	aag	cat	atg	tgg	aat	ttc	atc	4681

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Trp 945	Arg	Thr	Leu	Glu	Ala 950	Phe	Trp	Ala	Lys	His 955	Met	Trp	Asn	Phe	Ile 960	
agc Ser	ggg Gly	ata Ile	caa Gln	tat Tyr 965	tta Leu	gca Ala	ggc Gly	ttg Leu	tcc Ser 970	act Thr	ctg Leu	cct Pro	ggc Gly 975	aac Asn	ccc Pro	4729
gcg Ala	ata Ile	gca Ala	tca Ser 980	ctg Leu	atg Met	gca Ala	ttc Phe	aca Thr 985	gcc Ala	tct Ser	atc Ile	acc Thr	agc Ser 990	ccg Pro	ctc Leu	4777
acc Thr	acc Thr	caa Gln 995	cat His	acc Thr	ctc Leu	ctg Leu	ttt Phe 1000	aac Asn	atc Ile	ctg Leu	ggg Gly	gga Gly 1005	tgg Trp	gtg Val	gcc Ala	4825
gcc Ala	caa Gln 1010	ctt Leu	gct Ala	cct Pro	ccc Pro	agc Ser 1015	gct Ala	gct Ala	tct Ser	gct Ala	ttc Phe 1020	gta Val	ggc Gly	gcc Ala	ggc Gly	4873
atc Ile 1025	gct Ala	gga Gly	gcg Ala	gct Ala	gtt Val 1030	ggc Gly	agc Ser	ata Ile	ggc Gly	ctt Leu 1035	ggg Gly	aag Lys	gtg Val	ctt Leu	gtg Val 1040	4921
gat Asp	att Ile	ttg Leu	gca Ala	ggt Gly 1045	tat Tyr	gga Gly	gca Ala	ggg Gly	gtg Val 1050	gca Ala	ggc Gly	gcg Ala	ctc Leu	gtg Val 1055	gcc Ala	4969
ttt Phe	aag Lys	gtc Val	atg Met 1060	agc Ser	ggc Gly	gag Glu	atg Met	ccc Pro 1065	tcc Ser	acc Thr	gag Glu	gac Asp	ctg Leu 1070	gtt Val	aac Asn	5017
cta Leu	ctc Leu	cct Pro 1075	gct Ala	atc Ile	ctc Leu	tcc Ser	cct Pro 1080	ggc Gly	gcc Ala	cta Leu	gtc Val	gtc Val 1085	ggg Gly	gtc Val	gtg Val	5065
tgc Cys 1090	gca Ala	gcg Ala	ata Ile	ctg Leu	cgt Arg	cgg Arg 1095	cac His	gtg Val	ggc Gly	cca Pro	ggg Glu 1100	gag Glu	ggg Gly	gct Ala	gtg Val	5113
cag Gln 1105	tgg Trp	atg Met	aac Asn	cgg Arg	ctg Leu 1110	ata Ile	gcg Ala	ttc Phe	gct Ala 1115	tcg Ser	cgg Arg	ggt Gly	aac Asn	cac His	gtc Val 1120	5161
tcc Ser	ccc Pro	acg Thr	cac His	tat Tyr 1125	gtg Val	cct Pro	gag Glu	agc Ser	gac Asp 1130	gct Ala	gca Ala	gca Ala	cgt Arg	gtc Val 1135	act Thr	5209
cag Gln	atc Ile	ctc Leu	tct Ser 1140	agt Ser	ctt Leu	acc Thr	atc Ile	act Thr 1145	cag Gln	ctg Leu	ctg Leu	aag Lys	agg Arg 1150	ctt Leu	cac His	5257
cag Gln	tgg Trp	atc Ile 1155	aac Asn	gag Glu	gac Asp	tgc Cys	tcc Ser 1160	acg Thr	cca Pro	tgc Cys	tcc Ser	ggc Gly 1165	tcg Ser	tgg Trp	cta Leu	5305
aga Arg 1170	gat Asp	gtt Val	tgg Trp	gat Asp	tgg Trp	ata Ile 1175	tgc Cys	acg Thr	gtg Val	ttg Leu	act Thr 1180	gat Asp	ttc Phe	aag Lys	acc Thr	5353
tgg Trp 1185	ctc Leu	cag Gln	tcc Ser	aag Lys	ctc Leu 1190	ctg Leu	ccg Pro	cga Arg	ttg Leu	ccg Pro 1195	gga Gly	gtc Val	ccc Pro	ttc Phe	ttc Phe 1200	5401
tca Ser	tgt Cys	caa Gln	cgt Arg	ggg Gly 1205	tac Tyr	aag Lys	gga Gly	gtc Val	tgg Trp 1210	cgg Arg	ggc Gly	gac Asp	ggc Gly	atc Ile 1215	atg Met	5449
caa Ser	acc Thr	acc Thr	tgc Cys	cca Pro	tgt Trp	gga Glu	gca Ala	cag Glu	atc Thr	acc Thr	gga Glu	cat Glu	gtg Val	aaa Ala	aac Thr	5497

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Gln	Thr	Thr	Cys	Pro	Cys	Gly	Ala	Gln	Ile	Thr	Gly	His	Val	Lys	Asn	
			1220					1225					1230			
cgt	tcc	atg	agg	atc	gtg	ggg	cct	agg	acc	tgt	agt	aac	acg	tgg	cat	5545
Arg	Ser	Met	Arg	Ile	Val	Gly	Pro	Arg	Thr	Cys	Ser	Asn	Thr	Trp	His	
		1235				1240					1245					
gga	aca	ttc	ccc	att	aac	gcg	tac	acc	acg	ggc	ccc	tgc	acg	ccc	tcc	5593
Gly	Thr	Phe	Pro	Ile	Asn	Ala	Tyr	Thr	Thr	Gly	Pro	Cys	Thr	Pro	Ser	
	1250					1255					1260					
ccg	gcg	cca	aac	tat	tct	agg	gcg	ctg	tgg	cgg	gtg	gct	gct	gag	gag	5641
Pro	Ala	Pro	Asn	Tyr	Ser	Arg	Ala	Leu	Trp	Arg	Val	Ala	Ala	Glu	Glu	
1265					1270					1275					1280	
tac	gtg	gag	gtt	acg	cgg	gtg	ggg	gat	ttc	cac	tac	gtg	acg	ggc	atg	5689
Tyr	Val	Glu	Val	Thr	Arg	Val	Gly	Asp	Phe	His	Tyr	Val	Thr	Gly	Met	
				1285					1290					1295		
acc	act	gac	aac	gta	aag	tgc	ccg	tgt	cag	gtt	ccg	gcc	ccc	gaa	ttc	5737
Thr	Thr	Asp	Asn	Val	Lys	Cys	Pro	Cys	Gln	Val	Pro	Ala	Pro	Glu	Phe	
			1300					1305					1310			
ttc	aca	gaa	gtg	gat	ggg	gtg	cgg	ttg	cac	agg	tac	gct	cca	gag	tgc	5785
Phe	Thr	Glu	Val	Asp	Gly	Val	Arg	Leu	His	Arg	Tyr	Ala	Pro	Ala	Cys	
		1315					1320					1325				
aaa	ccc	ctc	cta	cgg	gag	gag	gtc	aca	ttc	ctg	gtc	ggg	ctc	aac	caa	5833
Lys	Pro	Leu	Leu	Arg	Glu	Glu	Val	Thr	Phe	Leu	Val	Gly	Leu	Asn	Gln	
	1330					1335					1340					
tac	ctg	gtt	ggg	tca	cag	ctc	cca	tgc	gag	ccc	gaa	ccg	gac	gta	gca	5881
Tyr	Leu	Val	Gly	Ser	Gln	Leu	Pro	Cys	Glu	Pro	Glu	Pro	Asp	Val	Ala	
1345					1350					1355					1360	
gtg	ctc	act	tcc	atg	ctc	acc	gac	ccc	tcc	cac	att	acg	gag	gag	acg	5929
Val	Leu	Thr	Ser	Met	Leu	Thr	Asp	Pro	Ser	His	Ile	Thr	Ala	Glu	Thr	
				1365					1370					1375		
gct	aag	cgt	agg	ctg	gcc	agg	gga	tct	ccc	ccc	tcc	ttg	gcc	agc	tca	5977
Ala	Lys	Arg	Arg	Leu	Ala	Arg	Gly	Ser	Pro	Pro	Ser	Leu	Ala	Ser	Ser	
			1380					1385					1390			
tca	gct	agc	cag	ctg	tct	gcg	cct	tcc	ttg	aag	gca	aca	tgc	act	acc	6025
Ser	Ala	Ser	Gln	Leu	Ser	Ala	Pro	Ser	Leu	Lys	Ala	Thr	Cys	Thr	Thr	
		1395					1400					1405				
cgt	cat	gac	tcc	ccg	gac	gct	gac	ctc	atc	gag	gcc	aac	ctc	ctg	tgg	6073
Arg	His	Asp	Ser	Pro	Asp	Ala	Asp	Leu	Ile	Glu	Ala	Asn	Leu	Leu	Trp	
	1410				1415						1420					
cgg	cag	gag	atg	ggc	ggg	aac	atc	acc	cgc	gtg	gag	tca	gaa	aac	aag	6121
Arg	Gln	Glu	Met	Gly	Gly	Asn	Ile	Thr	Arg	Val	Glu	Ser	Glu	Asn	Lys	
1425					1430					1435					1440	
gta	gta	att	ttg	gac	tct	ttc	gag	ccg	ctc	caa	gag	gag	gag	gat	gag	6169
Val	Val	Ile	Leu	Asp	Ser	Phe	Glu	Pro	Leu	Gln	Ala	Glu	Glu	Asp	Glu	
				1445					1450					1455		
agg	gaa	gta	tcc	gtt	ccg	gag	gag	atc	ctg	cgg	agg	tcc	agg	aaa	ttc	6217
Arg	Glu	Val	Ser	Val	Pro	Ala	Glu	Ile	Leu	Arg	Arg	Ser	Arg	Lys	Phe	
			1460					1465					1470			
cct	cga	gag	atg	ccc	ata	tgg	gca	cgc	ccg	gat	tac	aac	cct	cca	ctg	6265
Pro	Arg	Ala	Met	Pro	Ile	Trp	Ala	Arg	Pro	Asp	Tyr	Asn	Pro	Pro	Leu	
		1475					1480					1485				
tta	gag	tcc	tgg	aag	gac	ccg	gac	tac	gtc	cct	cca	gtg	gta	cac	ggg	6313

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Leu	Glu	Ser	Trp	Lys	Asp	Pro	Asp	Tyr	Val	Pro	Pro	Val	Val	His	Gly	
1490					1495					1500						
tgt	cca	ctg	ccg	cct	gcc	aag	gcc	cct	ccg	ata	cca	cct	cca	cgg	agg	6361
Cys	Pro	Leu	Pro	Pro	Ala	Lys	Ala	Pro	Pro	Ile	Pro	Pro	Pro	Arg	Arg	
1505					1510					1515					1520	
aag	agg	acg	gtt	gtc	ctg	tca	gaa	tct	acc	gtg	tct	tct	gcc	ttg	gcg	6409
Lys	Arg	Thr	Val	Val	Leu	Ser	Glu	Ser	Thr	Val	Ser	Ser	Ala	Leu	Ala	
				1525					1530					1535		
gag	ctc	gcc	aca	aag	acc	ttc	ggc	agc	tcc	gaa	tcg	tcg	gcc	gtc	gac	6457
Glu	Leu	Ala	Thr	Lys	Thr	Phe	Gly	Ser	Ser	Glu	Ser	Ser	Ala	Val	Asp	
			1540				1545						1550			
agc	ggc	acg	gca	acg	gcc	tct	cct	gac	cag	ccc	tcc	gac	gac	ggc	gac	6505
Ser	Gly	Thr	Ala	Thr	Ala	Ser	Pro	Asp	Gln	Pro	Ser	Asp	Asp	Gly	Asp	
		1555					1560					1565				
gcg	gga	tcc	gac	gtt	gag	tcg	tac	tcc	tcc	atg	ccc	ccc	ctt	gag	ggg	6553
Ala	Gly	Ser	Asp	Val	Glu	Ser	Tyr	Ser	Ser	Met	Pro	Pro	Leu	Glu	Gly	
	1570					1575					1580					
gag	ccg	ggg	gat	ccc	gat	ctc	agc	gac	ggg	cct	tgg	tct	acc	gta	agc	6601
Glu	Pro	Gly	Asp	Pro	Asp	Leu	Ser	Asp	Gly	Pro	Trp	Ser	Thr	Val	Ser	
1585					1590					1595					1600	
gag	gag	gct	agt	gag	gac	gtc	gtc	tgc	tgc	tcg	atg	tcc	tac	aca	tgg	6649
Glu	Glu	Ala	Ser	Glu	Asp	Val	Val	Cys	Cys	Ser	Met	Ser	Tyr	Thr	Trp	
				1605					1610					1615		
aca	ggc	gcc	ctg	atc	acg	cca	tgc	gct	gcg	gag	gaa	acc	aag	ctg	ccc	6697
Thr	Gly	Ala	Leu	Ile	Thr	Pro	Cys	Ala	Ala	Glu	Glu	Thr	Lys	Leu	Pro	
			1620					1625					1630			
atc	aat	gca	ctg	agc	aac	tct	ttg	ctc	cgt	cac	cac	aac	ttg	gtc	tat	6745
Ile	Asn	Ala	Leu	Ser	Asn	Ser	Leu	Leu	Arg	His	His	Asn	Leu	Val	Tyr	
		1635					1640					1645				
gct	aca	aca	tct	cgc	agc	gca	agc	ctg	cgg	cag	aag	aag	gtc	acc	ttt	6793
Ala	Thr	Thr	Ser	Arg	Ser	Ala	Ser	Leu	Arg	Gln	Lys	Lys	Val	Thr	Phe	
	1650					1655					1660					
gac	aga	ctg	cag	gtc	ctg	gac	gac	cac	tac	cgg	gac	gtg	ctc	aag	gag	6841
Asp	Arg	Leu	Gln	Val	Leu	Asp	Asp	His	Tyr	Arg	Asp	Val	Leu	Lys	Glu	
1665					1670					1675					1680	
atg	aag	gcg	aag	gcg	tcc	aca	gtt	aag	gct	aaa	ctt	cta	tcc	gtg	gag	6889
Met	Lys	Ala	Lys	Ala	Ser	Thr	Val	Lys	Ala	Lys	Leu	Leu	Ser	Val	Glu	
				1685				1690						1695		
gaa	gcc	tgt	aag	ctg	acg	ccc	cca	cat	tcg	gcc	aga	tct	aaa	ttt	ggc	6937
Glu	Ala	Cys	Lys	Leu	Thr	Pro	Pro	His	Ser	Ala	Arg	Ser	Lys	Phe	Gly	
			1700					1705					1710			
tat	ggg	gca	aag	gac	gtc	cgg	aac	cta	tcc	agc	aag	gcc	gtt	aac	cac	6985
Tyr	Gly	Ala	Lys	Asp	Val	Arg	Asn	Leu	Ser	Ser	Lys	Ala	Val	Asn	His	
		1715					1720					1725				
atc	cgc	tcc	gtg	tgg	aag	gac	ttg	ctg	gaa	gac	act	gag	aca	cca	att	7033
Ile	Arg	Ser	Val	Trp	Lys	Asp	Leu	Leu	Glu	Asp	Thr	Glu	Thr	Pro	Ile	
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gac	acc	acc	atc	atg	gca	aaa	aat	gag	gtt	ttc	tgc	gtc	caa	cca	gag	7081
Asp	Thr	Thr	Ile	Met	Ala	Lys	Asn	Glu	Val	Phe	Cys	Val	Gln	Pro	Glu	
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Lys	Gly	Gly	Arg	Lys	Pro	Ala	Arg	Leu	Ile	Val	Phe	Pro	Asp	Leu	Gly		
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Pro	Gln	Ala	Val	Met	Gly	Ser	Ser	Tyr	Gly	Phe	Gln	Tyr	Ser	Pro	Gly		
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Cys	Tyr	Leu	Lys	Ala	Ala	Ala	Ala	Cys	Arg	Ala	Ala	Lys	Leu	Gln	Asp		
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Asp	Ala	Ser	Gly	Lys	Arg	Val	Tyr	Tyr	Leu	Thr	Arg	Asp	Pro	Thr	Thr		
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Pro	Leu	Ala	Arg	Ala	Ala	Trp	Glu	Thr	Ala	Arg	His	Thr	Pro	Val	Asn		
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Ser	Trp	Leu	Gly	Asn	Ile	Ile	Met	Tyr	Ala	Pro	Thr	Leu	Trp	Ala	Arg		
			2020					2025					2030				
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Met	Ile	Leu	Met	Thr	His	Phe	Phe	Ser	Ile	Leu	Leu	Ala	Gln	Glu	Gln		
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Leu	Glu	Lys	Ala	Leu	Asp	Cys	Gln	Ile	Tyr	Gly	Ala	Cys	Tyr	Ser	Ile		
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Ala	Phe	Ser	Leu	His	Ser	Tyr	Ser	Pro	Gly	Glu	Ile	Asn	Arg	Val	Ala		
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Ser	Cys	Leu	Arg	Lys	Leu	Gly	Val	Pro	Pro	Leu	Arg	Val	Trp	Arg	His		
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Arg	Ala	Arg	Ser	Val	Arg	Ala	Arg	Leu	Leu	Ser	Gln	Gly	Gly	Arg	Ala		
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Lys	Leu	Thr	Pro	Ile	Pro	Ala	Ala	Ser	Gln	Leu	Asp	Leu	Ser	Ser	Trp		
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Phe	Val	Ala	Gly	Tyr	Ser	Gly	Gly	Asp	Ile	Tyr	His	Ser	Leu	Ser	Arg		
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Ala	Arg	Pro	Arg	Trp	Phe	Met	Trp	Cys	Leu	Leu	Leu	Leu	Ser	Val	Gly		
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		2195					2200										
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c atg gac cgg gag atg gca gca tcg tgc gga ggc gcg gtt ttc gta ggt 1849
Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Val Gly
1 5 10 15

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ctg ata ctc ttg acc ttg tca ccg cac tat aag ctg ttc ctc gct agg 1897
Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala Arg
20 25 30

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ctc ata tgg tgg tta caa tat ttt atc acc agg gcc gag gca cac ttg 1945
Leu Ile Trp Trp Leu Gln Tyr Phe Ile Thr Arg Ala Glu Ala His Leu
35 40 45

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caa gtg tgg atc ccc ccc ctc aac gtt cgg ggg ggc cgc gat gcc gtc 1993
Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val
50 55 60

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65 70 75 80

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Lys Ile Leu Leu Ala Ile Leu Gly Pro Leu Met Val Leu Gln Ala Gly
85 90 95

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Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg Ala
100 105 110

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tgc atg ctg gtg cgg aag gtt gct ggg ggt cat tat gtc caa atg gct 2185
Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met Ala
115 120 125

```

```

ctc atg aag ttg gcc gca ctg aca ggt acg tac gtt tat gac cat ctc 2233
Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu
130 135 140

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acc cca ctg cgg gac tgg gcc cac gcg ggc cta cga gac ctt gcg gtg 2281
Thr Pro Leu Arg Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val
145 150 155 160

```

```

gca gtt gag ccc gtc gtc ttc tct gat atg gag acc aag gtt atc acc 2329
Ala Val Glu Pro Val Val Phe Ser Asp Met Glu Thr Lys Val Ile Thr
165 170 175

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tgg ggg gca gac acc gcg gcg tgt ggg gac atc atc ttg ggc ctg ccc 2377
Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Leu Gly Leu Pro
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Leu	Glu	Gly	Gln	Gly	Trp	Arg	Leu	Leu	Ala	Pro	Ile	Thr	Ala	Tyr	Ser	
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caa	cag	acg	cga	ggc	cta	ctt	ggc	tgc	atc	atc	acc	agc	ctc	aca	ggc	2521
Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly	Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly	
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cgg	gac	agg	aac	cag	gtc	gag	ggg	gag	gtc	caa	gtg	gtc	tcc	acc	gca	2569
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aca	caa	tct	ttc	ctg	gcg	acc	tgc	gtc	aat	ggc	gtg	tgt	tgg	act	gtc	2617
Thr	Gln	Ser	Phe	Leu	Ala	Thr	Cys	Val	Asn	Gly	Val	Cys	Trp	Thr	Val	
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Tyr	His	Gly	Ala	Gly	Ser	Lys	Thr	Leu	Ala	Gly	Pro	Lys	Gly	Pro	Ile	
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Thr	Gln	Met	Tyr	Thr	Asn	Val	Asp	Gln	Asp	Leu	Val	Gly	Trp	Gln	Ala	
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Pro	Pro	Gly	Ala	Arg	Ser	Leu	Thr	Pro	Cys	Thr	Cys	Gly	Ser	Ser	Asp	
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Leu	Tyr	Leu	Val	Thr	Lys	His	Ala	Asp	Val	Ile	Pro	Val	Arg	Arg	Arg	
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Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu	Leu	Cys	Pro	Ser	Gly	His	Ala	Val	
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Gly	Ile	Phe	Arg	Ala	Ala	Val	Cys	Thr	Arg	Gly	Val	Ala	Lys	Ala	Val	
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Asp	Phe	Val	Pro	Val	Glu	Ser	Met	Glu	Thr	Thr	Met	Arg	Ser	Pro	Val	
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Phe	Thr	Asp	Asn	Ser	Ser	Pro	Pro	Ala	Val	Pro	Gln	Thr	Phe	Gln	Val	
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gcc	cat	cta	cac	gcc	cct	act	ggt	agc	ggc	aag	agc	act	aag	gtg	ccg	3097
Ala	His	Leu	His	Ala	Pro	Thr	Gly	Ser	Gly	Lys	Ser	Thr	Lys	Val	Pro	
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Ala	Ala	Tyr	Ala	Ala	Gln	Gly	Tyr	Lys	Val	Leu	Val	Leu	Asn	Pro	Ser	
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Val	Ala	Ala	Thr	Leu	Gly	Phe	Gly	Ala	Tyr	Met	Ser	Lys	Ala	His	Gly	
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ccc Pro	atc Ile	acg Thr	tac Tyr	tcc Ser 485	acc Thr	tat Tyr	ggc Gly	aag Lys	ttt Phe 490	ctt Leu	gcc Ala	gac Asp	ggg Gly	ggg Gly 495	tgc Cys	3289
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tca Ser	gtg Val	atc Ile	gac Asp	tgc Cys 645	aat Asn	aca Thr	tgt Cys	gtc Val	acc Thr 650	cag Gln	aca Thr	gtc Val	gac Asp	ttc Phe 655	agc Ser	3769
ctg Leu	gac Asp	ccg Pro	acc Thr 660	ttc Phe	acc Thr	att Ile	gag Glu 665	acg Thr	acg Thr	acc Thr	gtg Val	cca Pro	caa Gln 670	gac Asp	gcg Ala	3817
gtg Val	tca Ser	cgc Arg 675	tcg Ser	cag Gln	cgg Arg	cga Arg	ggc Gly 680	agg Arg	act Thr	ggg Gly	agg Arg	ggc Gly 685	agg Arg	atg Met	ggc Gly	3865
att Ile	tac Tyr 690	agg Arg	ttt Phe	gtg Val	act Thr	cca Pro 695	gga Gly	gaa Glu	cgg Arg	ccc Pro	tcg Ser 700	ggc Gly	atg Met	ttc Phe	gat Asp	3913
tcc Ser 705	tcg Ser	gtt Val	ctg Leu	tgc Cys	gag Glu 710	tgc Cys	tat Tyr	gac Asp	gcg Ala	ggc Gly 715	tgt Cys	gct Ala	tgg Trp	tac Tyr	gag Glu 720	3961
ctc Leu	acg Thr	ccc Pro	gcc Ala	gag Glu 725	acc Thr	tca Ser	gtt Val	agg Arg	ttg Leu 730	cgg Arg	gct Ala	tac Tyr	cta Leu	aac Asn 735	aca Thr	4009

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cca	ggg	ttg	ccc	gtc	tgc	cag	gac	cat	ctg	gag	ttc	tgg	gag	ggc	gtc	4057
Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp	His	Leu	Glu	Phe	Trp	Glu	Gly	Val	
			740					745					750			
ttt	aca	ggc	ctc	acc	cac	ata	gac	gcc	cat	ttc	ttg	tcc	cag	act	aag	4105
Phe	Thr	Gly	Leu	Thr	His	Ile	Asp	Ala	His	Phe	Leu	Ser	Gln	Thr	Lys	
		755					760					765				
cag	gca	gga	gac	aac	ttc	ccc	tac	ctg	gta	gca	tac	cag	gct	acg	gtg	4153
Gln	Ala	Gly	Asp	Asn	Phe	Pro	Tyr	Leu	Val	Ala	Tyr	Gln	Ala	Thr	Val	
	770					775					780					
tgc	gcc	agg	gct	cag	gct	cca	cct	cca	tcg	tgg	gac	caa	atg	tgg	aag	4201
Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro	Pro	Ser	Trp	Asp	Gln	Met	Trp	Lys	
785					790					795				800		
tgt	ctc	ata	cgg	cta	aag	cct	acg	ctg	cac	ggg	cca	acg	ccc	ctg	ctg	4249
Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr	Leu	His	Gly	Pro	Thr	Pro	Leu	Leu	
				805					810					815		
tat	agg	ctg	gga	gcc	gtt	caa	aac	gag	gtt	act	acc	aca	cac	ccc	ata	4297
Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn	Glu	Val	Thr	Thr	Thr	His	Pro	Ile	
			820					825					830			
acc	aaa	tac	atc	atg	gca	tgc	atg	tcg	gct	gac	ctg	gag	gtc	gtc	acg	4345
Thr	Lys	Tyr	Ile	Met	Ala	Cys	Met	Ser	Ala	Asp	Leu	Glu	Val	Val	Thr	
		835					840					845				
agc	acc	tgg	gtg	ctg	gta	ggc	gga	gtc	cta	gca	gct	ctg	gct	gcg	tat	4393
Ser	Thr	Trp	Val	Leu	Val	Gly	Gly	Val	Leu	Ala	Ala	Leu	Ala	Ala	Tyr	
	850					855					860					
tgc	ctg	aca	aca	ggc	agc	gtg	gtc	att	gtg	ggc	agg	atc	atc	ttg	tcc	4441
Cys	Leu	Thr	Thr	Gly	Ser	Val	Val	Ile	Val	Gly	Arg	Ile	Ile	Leu	Ser	
865					870					875				880		
gga	agg	ccg	gcc	atc	att	ccc	gac	agg	gaa	gtc	ctt	tac	cgg	gag	ttc	4489
Gly	Arg	Pro	Ala	Ile	Ile	Pro	Asp	Arg	Glu	Val	Leu	Tyr	Arg	Glu	Phe	
				885					890					895		
gat	gag	atg	gaa	gag	tgt	gcc	tca	cac	ctc	cct	tac	atc	gaa	cag	gga	4537
Asp	Glu	Met	Glu	Glu	Cys	Ala	Ser	His	Leu	Pro	Tyr	Ile	Glu	Gln	Gly	
			900					905					910			
atg	cag	ctc	gcc	gaa	caa	ttc	aaa	cag	aag	gca	atc	ggg	ttg	ctg	caa	4585
Met	Gln	Leu	Ala	Glu	Gln	Phe	Lys	Gln	Lys	Ala	Ile	Gly	Leu	Leu	Gln	
		915					920					925				
aca	gcc	acc	aag	caa	gcg	gag	gct	gct	gct	ccc	gtg	gtg	gaa	tcc	aag	4633
Thr	Ala	Thr	Lys	Gln	Ala	Glu	Ala	Ala	Ala	Pro	Val	Val	Glu	Ser	Lys	
	930					935					940					
tgg	cgg	acc	ctc	gaa	gcc	ttc	tgg	gcg	aag	cat	atg	tgg	aat	ttc	atc	4681
Trp	Arg	Thr	Leu	Glu	Ala	Phe	Trp	Ala	Lys	His	Met	Trp	Asn	Phe	Ile	
945					950					955				960		
agc	ggg	ata	caa	tat	tta	gca	ggc	ttg	tcc	act	ctg	cct	ggc	aac	ccc	4729
Ser	Gly	Ile	Gln	Tyr	Leu	Ala	Gly	Leu	Ser	Thr	Leu	Pro	Gly	Asn	Pro	
				965					970					975		
gcg	ata	gca	tca	ctg	atg	gca	ttc	aca	gcc	tct	atc	acc	agc	ccg	ctc	4777
Ala	Ile	Ala	Ser	Leu	Met	Ala	Phe	Thr	Ala	Ser	Ile	Thr	Ser	Pro	Leu	
			980					985					990			
acc	acc	caa	cat	acc	ctc	ctg	ttt	aac	atc	ctg	ggg	gga	tgg	gtg	gcc	4825
Thr	Thr	Gln	His	Thr	Leu	Leu	Phe	Asn	Ile	Leu	Gly	Gly	Trp	Val	Ala	
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gcc	caa	ctt	gct	cct	ccc	agc	gct	gct	tcc	gct	ttc	gta	ggc	gcc	ggc	4873
Ala	Gln	Leu	Ala	Pro	Pro	Ser	Ala	Ala	Ser	Ala	Phe	Val	Gly	Ala	Gly	
	1010					1015					1020					
atc	gct	gga	gcg	gct	ggt	ggc	agc	ata	ggc	ctt	ggg	aag	gtg	ctt	gtg	4921
Ile	Ala	Gly	Ala	Ala	Val	Gly	Ser	Ile	Gly	Leu	Gly	Lys	Val	Leu	Val	
	1025				1030					1035					1040	
gat	att	ttg	gca	ggt	tat	gga	gca	ggg	gtg	gca	ggc	gcg	ctc	gtg	gcc	4969
Asp	Ile	Leu	Ala	Gly	Tyr	Gly	Ala	Gly	Val	Ala	Gly	Ala	Leu	Val	Ala	
				1045					1050					1055		
ttt	aag	gtc	atg	agc	ggc	gag	atg	ccc	tcc	acc	gag	gac	ctg	gtt	aac	5017
Phe	Lys	Val	Met	Ser	Gly	Glu	Met	Pro	Ser	Thr	Glu	Asp	Leu	Val	Asn	
			1060					1065					1070			
cta	ctc	cct	gct	atc	ctc	tcc	cct	ggc	gcc	cta	gtc	gtc	ggg	gtc	gtg	5065
Leu	Leu	Pro	Ala	Ile	Leu	Ser	Pro	Gly	Ala	Leu	Val	Val	Gly	Val	Val	
		1075					1080						1085			
tgc	gca	gcg	ata	ctg	cgt	cgg	cac	gtg	ggc	cca	ggg	gag	ggg	gct	gtg	5113
Cys	Ala	Ala	Ile	Leu	Arg	Arg	His	Val	Gly	Pro	Gly	Glu	Gly	Ala	Val	
	1090					1095					1100					
cag	tgg	atg	aac	cgg	ctg	ata	gcg	ttc	gct	tcg	cgg	ggt	aac	cac	gtc	5161
Gln	Trp	Met	Asn	Arg	Leu	Ile	Ala	Phe	Ala	Ser	Arg	Gly	Asn	His	Val	
	1105				1110					1115					1120	
tcc	ccc	acg	cac	tat	gtg	cct	gag	agc	gac	gct	gca	gca	cgt	gtc	act	5209
Ser	Pro	Thr	His	Tyr	Val	Pro	Glu	Ser	Asp	Ala	Ala	Ala	Arg	Val	Thr	
				1125					1130					1135		
cag	atc	ctc	tct	agt	ctt	acc	atc	act	cag	ctg	ctg	aag	agg	ctt	cac	5257
Gln	Ile	Leu	Ser	Ser	Leu	Thr	Ile	Thr	Gln	Leu	Leu	Lys	Arg	Leu	His	
			1140					1145					1150			
cag	tgg	atc	aac	gag	gac	tgc	tcc	acg	cca	tgc	tcc	ggc	tcg	tgg	cta	5305
Gln	Trp	Ile	Asn	Glu	Asp	Cys	Ser	Thr	Pro	Cys	Ser	Gly	Ser	Trp	Leu	
		1155					1160					1165				
aga	gat	gtt	tgg	gat	tgg	ata	tgc	acg	gtg	ttg	act	gat	ttc	aag	gcc	5353
Arg	Asp	Val	Trp	Asp	Trp	Ile	Cys	Thr	Val	Leu	Thr	Asp	Phe	Lys	Ala	
	1170					1175					1180					
tgg	ctc	cag	tcc	aag	ctc	ctg	ccg	cga	ttg	ccg	gga	gtc	ccc	ttc	ttc	5401
Trp	Leu	Gln	Ser	Lys	Leu	Leu	Pro	Arg	Leu	Pro	Gly	Val	Pro	Phe	Phe	
	1185				1190					1195					1200	
tca	tgt	caa	cgt	ggg	tac	aag	gga	gtc	tgg	cgg	ggc	gac	ggc	atc	atg	5449
Ser	Cys	Gln	Arg	Gly	Tyr	Lys	Gly	Val	Trp	Arg	Gly	Asp	Gly	Ile	Met	
				1205					1210					1215		
caa	acc	acc	tgc	cca	tgt	gga	gca	cag	atc	acc	gga	cat	gtg	aaa	aac	5497
Gln	Thr	Thr	Cys	Pro	Cys	Gly	Ala	Gln	Ile	Thr	Gly	His	Val	Lys	Asn	
			1220					1225					1230			
tgt	tcc	atg	agg	atc	gtg	ggg	cct	agg	acc	tgt	agt	aac	acg	tgg	cat	5545
Cys	Ser	Met	Arg	Ile	Val	Gly	Pro	Arg	Thr	Cys	Ser	Asn	Thr	Trp	His	
		1235					1240					1245				
gga	aca	ttc	ccc	att	aac	gcg	tac	acc	acg	ggc	ccc	tgc	acg	ccc	tcc	5593
Gly	Thr	Phe	Pro	Ile	Asn	Ala	Tyr	Thr	Thr	Gly	Pro	Cys	Thr	Pro	Ser	
	1250					1255					1260					
ccg	gcg	cca	aat	tat	tct	agg	gcg	ctg	tgg	cgg	gtg	gct	gct	gag	gag	5641
Pro	Ala	Pro	Asn	Tyr	Ser	Arg	Ala	Leu	Trp	Arg	Val	Ala	Ala	Glu	Glu	
	1265				1270					1275					1280	

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tac gtg gag gtt acg cga gtg ggg gat ttc cac tac gtg acg ggc atg Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met 1285 1290 1295	5689
acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe 1300 1305 1310	5737
ttc aca gaa gtg gat ggg gtg cgg ttg cac agg tac gct cca gcg tgc Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys 1315 1320 1325	5785
aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln 1330 1335 1340	5833
tac ccg gtt ggg tca cag ctc cca tgc gag ccc gaa ctg gac gta gca Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Leu Asp Val Ala 1345 1350 1355 1360	5881
gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr 1365 1370 1375	5929
gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser 1380 1385 1390	5977
tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr 1395 1400 1405	6025
cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp 1410 1415 1420	6073
cgg cag gag atg ggc ggg aac atc acc cgc gtg gag tca gag aat aag Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys 1425 1430 1435 1440	6121
gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu 1445 1450 1455	6169
agg gaa gta tcc gtt ccg gcg gag atc ctg cgg agg tcc agg aaa ttc Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe 1460 1465 1470	6217
cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu 1475 1480 1485	6265
tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Val Val His Gly 1490 1495 1500	6313
tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca cgg agg Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg 1505 1510 1515 1520	6361
aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala 1525 1530 1535	6409
gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp 1540 1545 1550	6457

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agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp 1555 1560 1565	6505
gcg gga tcc gac gtt gag tcg tac tcc tcc atg ccc ccc ctt gag ggg Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly 1570 1575 1580	6553
gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser 1585 1590 1600	6601
gag gag gct agt gag gac gtc gtc tgc tgc tcg atg tcc tac aca tgg Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp 1605 1610 1615	6649
aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro 1620 1625 1630	6697
atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr 1635 1640 1645	6745
gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe 1650 1655 1660	6793
gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu 1665 1670 1675 1680	6841
atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu 1685 1690 1695	6889
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly 1700 1705 1710	6937
tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His 1715 1720 1725	6985
atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile 1730 1735 1740	7033
gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu 1745 1750 1755 1760	7081
aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly 1765 1770 1775	7129
gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu 1780 1785 1790	7177
cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly 1795 1800 1805	7225
cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro 1810 1815 1820	7273

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atg ggc ttc gca tat	gac acc cgc tgt ttt gac tca acg gtc act gag	7321
Met Gly Phe Ala Tyr	Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu	
1825	1830 1835 1840	
aat gac atc cgt gtt	gag gag tca atc tac caa tgt tgt gac ttg gcc	7369
Asn Asp Ile Arg Val	Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala	
1845	1850 1855	
ccc gaa gcc aga cag	gcc ata agg tcg ctc aca gag cgg ctt tac atc	7417
Pro Glu Ala Arg Gln	Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile	
1860	1865 1870	
ggg ggc ccc ctg act	aat tct aaa ggg cag aac tgc ggc tat cgc cgg	7465
Gly Gly Pro Leu Thr	Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg	
1875	1880 1885	
tgc cgc gcg agc ggt	gta ctg acg acc agc tgc ggt aat acc ctc aca	7513
Cys Arg Ala Ser Gly	Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr	
1890	1895 1900	
tgt tac ttg aag gcc	gct gcg gcc tgt cga gct gcg aag ctc cag gac	7561
Cys Tyr Leu Lys Ala	Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp	
1905	1910 1915 1920	
tgc acg atg ctc gta	tgc gga gac gac ctt gtc gtt atc tgt gaa agc	7609
Cys Thr Met Leu Val	Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser	
1925	1930 1935	
gcg ggg acc caa gag	gac gag gcg agc cta cgg gcc ttc acg gag gct	7657
Ala Gly Thr Gln Glu	Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala	
1940	1945 1950	
atg act aga tac tct	gcc ccc cct ggg gac ccg ccc aaa cca gaa tac	7705
Met Thr Arg Tyr Ser	Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr	
1955	1960 1965	
gac ttg gag ttg ata	aca tca tgc tcc tcc aat gtg tca gtc gcg cac	7753
Asp Leu Glu Leu Ile	Thr Ser Cys Ser Ser Asn Val Ser Val Ala His	
1970	1975 1980	
gat gca tct ggc aaa	agg gtg tac tat ctc acc cgt gac ccc acc acc	7801
Asp Ala Ser Gly Lys	Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr	
1985	1990 1995 2000	
ccc ctt gcg cgg gct	gcg tgg gag aca gct aga cac act cca gtc aat	7849
Pro Leu Ala Arg Ala	Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn	
2005	2010 2015	
tcc tgg cta ggc aac	atc atc atg tat gcg ccc acc ttg tgg gca agg	7897
Ser Trp Leu Gly Asn	Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg	
2020	2025 2030	
atg atc ctg atg act	cat ttc ttc tcc atc ctt cta gct cag gaa caa	7945
Met Ile Leu Met Thr	His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln	
2035	2040 2045	
ctt gaa aaa gcc cta	gat tgt cag atc tac ggg gcc tgt tac tcc att	7993
Leu Glu Lys Ala Leu	Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile	
2050	2055 2060	
gag cca ctt gac cta	cct cag atc att caa cga ctc cac ggc ctt agc	8041
Glu Pro Leu Asp Leu	Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser	
2065	2070 2075 2080	
gca ttt tca ctc cat	agt tac tct cca ggt gag atc aat agg gtg gct	8089
Ala Phe Ser Leu His	Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala	
2085	2090 2095	

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tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat	8137
Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His	
2100 2105 2110	
cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct	8185
Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala	
2115 2120 2125	
gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc	8233
Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu	
2130 2135 2140	
aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg	8281
Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp	
2145 2150 2155 2160	
ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt	8329
Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg	
2165 2170 2175	
gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg	8377
Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Leu Ser Val Gly	
2180 2185 2190	
gta ggc atc tat cta ctc ccc aac cga tga acgaggagct aaacactcca	8427
Val Gly Ile Tyr Leu Leu Pro Asn Arg *	
2195 2200	
ggccaatagg ccatcctggt tttttccctt tttttttttc tttttttttt tttttttttt	8487
tttttttttt ttttctcctt tttttttcct ctttttttcc ttttctttcc tttggtggct	8547
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gac	63
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<210> 12	
<211> 45	

<212> DNA
 <213> HCV

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 <220>
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c atg gac	cg gag	atg gca	gca tcg	tgc gga	ggc gcg	ggt 1849		
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Gln Val	Trp Ile	Pro Pro	Leu Asn	Val Arg	Gly Gly	Arg Arg	Asp Ala	Val
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Cys Met	Leu Val	Arg Lys	Val Ala	Gly Gly	His Tyr	Val Gln	Met Ala	
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Val Ser	Ala Arg	Arg Gly	Arg Glu	Ile Ile	His Leu	Gly Pro	Ala Asp	Ser
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Arg Asp	Arg Asn	Gln Val	Glu Glu	Gly Glu	Val Gln	Val Val	Ser Thr	Ala
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Phe	Lys	Val	Met	Ser	Gly	Glu	Met	Pro	Ser	Thr	Glu	Asp	Leu	Val	Asn	
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Leu	Leu	Pro	Ala	Ile	Leu	Ser	Pro	Gly	Ala	Leu	Val	Val	Gly	Val	Val	
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Cys	Ala	Ala	Ile	Leu	Arg	Arg	His	Val	Gly	Pro	Gly	Glu	Gly	Ala	Val	
	1090					1095					1100					
cag	tgg	atg	aac	cgg	ctg	ata	gcg	ttc	gct	tcg	cgg	ggt	aac	cac	gtc	5161
Gln	Trp	Met	Asn	Arg	Leu	Ile	Ala	Phe	Ala	Ser	Arg	Gly	Asn	His	Val	
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Ser	Pro	Thr	His	Tyr	Val	Pro	Glu	Ser	Asp	Ala	Ala	Ala	Arg	Val	Thr	
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Gln	Ile	Leu	Ser	Ser	Leu	Thr	Ile	Thr	Gln	Leu	Leu	Lys	Arg	Leu	His	
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Gln	Trp	Ile	Asn	Glu	Asp	Cys	Ser	Thr	Pro	Cys	Ser	Gly	Ser	Trp	Leu	
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Arg	Asp	Val	Trp	Asp	Trp	Ile	Cys	Thr	Val	Leu	Thr	Asp	Phe	Lys	Thr	
	1170					1175					1180					
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Trp	Leu	Gln	Ser	Lys	Leu	Leu	Pro	Arg	Leu	Pro	Gly	Val	Pro	Phe	Phe	
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Ser	Cys	Gln	Arg	Gly	Tyr	Lys	Gly	Val	Trp	Arg	Gly	Asp	Gly	Ile	Met	
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Gln	Thr	Thr	Cys	Pro	Cys	Gly	Ala	Gln	Ile	Thr	Gly	His	Val	Lys	Asn	
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Tyr	Val	Glu	Val	Thr	Arg	Val	Gly	Asp	Phe	His	Tyr	Val	Thr	Gly	Met	
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Thr	Thr	Asp	Asn	Val	Lys	Cys	Pro	Cys	Gln	Val	Pro	Ala	Pro	Glu	Phe	
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Phe	Thr	Glu	Val	Asp	Gly	Val	Arg	Leu	His	Arg	Tyr	Ala	Pro	Ala	Cys	
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Lys	Pro	Leu	Leu	Arg	Glu	Glu	Val	Thr	Phe	Leu	Val	Gly	Leu	Asn	Gln	
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gct Ala	aag Lys	cgt Arg	agg Arg 1380	ctg Leu	gcc Ala	agg Arg	gga Gly	tct Ser 1385	ccc Pro	ccc Pro	tcc Ser	ttg Leu	gcc Ala 1390	agc Ser	tca Ser	5977
tca Ser	gct Ala	agc Ser 1395	cag Gln	ctg Leu	tct Ser	gcg Ala	cct Pro 1400	tcc Ser	ttg Leu	aag Lys	gca Ala	aca Thr 1405	tgc Cys	act Thr	acc Thr	6025
cgt Arg	cat His 1410	gac Asp	tcc Ser	ccg Pro	gac Asp	gct Ala 1415	gac Asp	ctc Leu	atc Ile	gag Glu	gcc Ala 1420	aac Asn	ctc Leu	ctg Leu	tgg Trp	6073
cgg Arg 1425	cag Gln	gag Glu	atg Met	ggc Gly 1430	ggg Gly	aac Asn	atc Ile	acc Thr	cgc Arg	gtg Val 1435	gag Glu	tca Ser	gaa Glu	aat Asn	aag Lys 1440	6121
gta Val	gta Val	att Ile	ttg Leu	gac Asp 1445	tct Ser	ttc Phe	gag Glu	ccg Pro	ctc Leu 1450	caa Gln	gcg Ala	gag Glu	gag Glu	gat Asp 1455	gag Glu	6169
agg Arg	gaa Glu	gta Val	tcc Ser 1460	gtt Val	ccg Pro	gcg Ala	gag Glu	atc Ile 1465	ctg Leu	cgg Arg	agg Arg	tcc Ser	agg Arg 1470	aaa Lys	ttc Phe	6217
cct Pro	cga Arg	gcg Ala 1475	atg Met	ccc Pro	ata Ile	tgg Trp	gca Ala 1480	cgc Arg	ccg Pro	gat Asp	tac Tyr	aac Asn 1485	cct Pro	cca Pro	ctg Leu	6265
tta Leu	gag Glu 1490	tcc Ser	tgg Trp	aag Lys	gac Asp	ccg Pro 1495	gac Asp	tac Tyr	gtc Val	cct Pro 1500	cca Val	gtg Val	gta Val	cac His	ggg Gly	6313
tgt Cys 1505	cca Pro	ttg Leu	ccg Pro	cct Pro	gcc Ala 1510	aag Lys	gcc Ala	cct Pro	ccg Pro	ata Ile 1515	cca Pro	cct Pro	cca Pro	cgg Arg	agg Arg 1520	6361
aag Lys	agg Arg	acg Thr	gtt Val	gtc Val 1525	ctg Leu	tca Ser	gaa Glu	tct Ser	acc Thr 1530	gtg Val	tct Ser	tct Ser	gcc Ala	ttg Leu 1535	gcg Ala	6409
gag Glu	ctc Leu	gcc Ala	aca Thr 1540	aag Lys	acc Thr	ttc Phe	ggc Gly	agc Ser 1545	tcc Ser	gaa Glu	tcg Ser	tcg Ser	gcc Ala 1550	gtc Val	gac Asp	6457
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gcg Ala 1570	gga Gly	tcc Ser	gac Asp	gtt Val	gag Glu	tcg Ser 1575	tac Tyr	tcc Ser	tcc Ser	atg Met 1580	ccc Pro	ccc Pro	ctt Leu	gag Glu	ggg Gly	6553
gag Glu 1585	ccg Pro	ggg Gly	gat Asp	ccc Pro	gat Asp 1590	ctc Leu	agc Ser	gac Asp	ggg Gly	tct Ser 1595	tgg Trp	tct Ser	acc Thr	gta Val	agc Ser 1600	6601
gag Glu	gag Glu	gct Ala	agt Ser	gag Glu 1605	gac Asp	gtc Val	gtc Val	tgc Cys	tgc Cys 1610	tcg Ser	atg Met	tcc Ser	tac Tyr	aca Thr 1615	tgg Trp	6649
aca	ggc	gcc	ctg	atc	acg	cca	tgc	gct	gcg	gag	gaa	acc	aag	ctg	ccc	6697

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Ile	Asn	Ala	Leu	Ser	Asn	Ser	Leu	Leu	Arg	His	His	Asn	Leu	Val	Tyr		
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gct	aca	aca	tct	cgc	agc	gca	agc	ctg	cgg	cag	aag	aag	gtc	acc	ttt	6793	
Ala	Thr	Thr	Ser	Arg	Ser	Ala	Ser	Leu	Arg	Gln	Lys	Lys	Val	Thr	Phe		
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gac	aga	ctg	cag	gtc	ctg	gac	gac	cac	tac	cgg	gac	gtg	ctc	aag	gag	6841	
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gaa	gcc	tgt	aag	ctg	acg	ccc	cca	cat	tcg	gcc	aga	tct	aaa	ttt	ggc	6937	
Glu	Ala	Cys	Lys	Leu	Thr	Pro	Pro	His	Ser	Ala	Arg	Ser	Lys	Phe	Gly		
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Tyr	Gly	Ala	Lys	Asp	Val	Arg	Asn	Leu	Ser	Ser	Lys	Ala	Val	Asn	His		
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	1730					1735					1740						
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Lys	Gly	Gly	Arg	Lys	Pro	Ala	Arg	Leu	Ile	Val	Phe	Pro	Asp	Leu	Gly		
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gtt	cgt	gtg	tgc	gag	aaa	atg	gcc	ctt	tac	gat	gtg	gtc	tcc	acc	ctc	7177	
Val	Arg	Val	Cys	Glu	Lys	Met	Ala	Leu	Tyr	Asp	Val	Val	Ser	Thr	Leu		
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cct	cag	gcc	gtg	atg	ggc	tct	tca	tac	gga	ttc	caa	tac	tct	cct	gga	7225	
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Gln	Arg	Val	Glu	Phe	Leu	Val	Asn	Ala	Trp	Lys	Ala	Lys	Lys	Cys	Pro		
	1810				1815						1820						
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Pro	Glu	Ala	Arg	Gln	Ala	Ile	Arg	Ser	Leu	Thr	Glu	Arg	Leu	Tyr	Ile		
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Gly	Gly	Pro	Leu	Thr	Asn	Ser	Lys	Gly	Gln	Asn	Cys	Gly	Tyr	Arg	Arg		
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Cys	Arg	Ala	Ser	Gly	Val	Leu	Thr	Thr	Ser	Cys	Gly	Asn	Thr	Leu	Thr	
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Cys	Tyr	Leu	Lys	Ala	Ala	Ala	Ala	Cys	Arg	Ala	Ala	Lys	Leu	Gln	Asp	
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Cys	Thr	Met	Leu	Val	Cys	Gly	Asp	Asp	Leu	Val	Val	Ile	Cys	Glu	Ser	
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Ala	Gly	Thr	Gln	Glu	Asp	Glu	Ala	Ser	Leu	Arg	Ala	Phe	Thr	Glu	Ala	
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Met	Thr	Arg	Tyr	Ser	Ala	Pro	Pro	Gly	Asp	Pro	Pro	Lys	Pro	Glu	Tyr	
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Asp	Leu	Glu	Leu	Ile	Thr	Ser	Cys	Ser	Ser	Asn	Val	Ser	Val	Ala	His	
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ccc	ctt	gcg	cgg	gct	gcg	tgg	gag	aca	gct	aga	cac	act	cca	gtc	aat	7849
Pro	Leu	Ala	Arg	Ala	Ala	Trp	Glu	Thr	Ala	Arg	His	Thr	Pro	Val	Asn	
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Ser	Trp	Leu	Gly	Asn	Ile	Ile	Met	Tyr	Ala	Pro	Thr	Leu	Trp	Ala	Arg	
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Leu	Glu	Lys	Ala	Leu	Asp	Cys	Gln	Ile	Tyr	Gly	Ala	Cys	Tyr	Ser	Ile	
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Arg	Ala	Arg	Ser	Val	Arg	Ala	Arg	Leu	Leu	Ser	Gln	Gly	Gly	Arg	Ala	
		2115					2120					2125				
gcc	act	tgt	ggc	aag	tac	ctc	ttc	aac	tgg	gca	gta	agg	acc	aag	ctc	8233
Ala	Thr	Cys	Gly	Lys	Tyr	Leu	Phe	Asn	Trp	Ala	Val	Arg	Thr	Lys	Leu	
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Lys	Leu	Thr	Pro	Ile	Pro	Ala	Ala	Ser	Gln	Leu	Asp	Leu	Ser	Ser	Trp	
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Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Leu Ser Val Gly
2180 2185 2190

gta ggc atc tat cta ctc ccc aac cga tga acgaggagct aaacactcca 8427
Val Gly Ile Tyr Leu Leu Pro Asn Arg *
2195 2200

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gaacccccca cctggcgaca ggtgcctctg cggccaaaag ccacgtgtat aagatacacc 1560
tgcaaaggcg gcacaacccc agtgccacgt tgtgagttgg atagttgtgg aaagagtcaa 1620
atggctctcc tcaagcgtat tcaacaagg gctgaaggat gcccagaagg taccctattg 1680
tatgggatct gatctggggc ctcggtgcac atgctttaca tgtgtttagt cgaggttaaa 1740
aaacgtctag gcccccgaa ccacggggac gtggttttcc tttgaaaaac acgataatac 1800
c atg gac cgg gag atg gca gca tcg tgc gga ggc gcg gtt ttc gta ggt 1849
Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Val Gly
1 5 10 15

ctg ata ctc ttg acc ttg tca ccg cac tat aag ctg ttc ctc gct agg 1897
Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala Arg
20 25 30

ctc ata tgg tgg tta caa tat ttt atc acc agg gcc gag gca cac ttg 1945
Leu Ile Trp Trp Leu Gln Tyr Phe Ile Thr Arg Ala Glu Ala His Leu
35 40 45

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caa	gtg	tgg	atc	ccc	ccc	ctc	aac	gtt	cgg	ggg	ggc	cgc	gat	gcc	gtc	1993
Gln	Val	Trp	Ile	Pro	Pro	Leu	Asn	Val	Arg	Gly	Gly	Arg	Asp	Ala	Val	
	50					55					60					
atc	ctc	ctc	acg	tgc	gcg	atc	cac	cca	gag	cta	atc	ttt	acc	atc	acc	2041
Ile	Leu	Leu	Thr	Cys	Ala	Ile	His	Pro	Glu	Leu	Ile	Phe	Thr	Ile	Thr	
65					70					75					80	
aaa	atc	ttg	ctc	gcc	ata	ctc	ggt	cca	ctc	atg	gtg	ctc	cag	gct	ggt	2089
Lys	Ile	Leu	Leu	Ala	Ile	Leu	Gly	Pro	Leu	Met	Val	Leu	Gln	Ala	Gly	
				85					90					95		
ata	acc	aaa	gtg	ccg	tac	ttc	gtg	cgc	gca	cac	ggg	ctc	att	cg	gca	2137
Ile	Thr	Lys	Val	Pro	Tyr	Phe	Val	Arg	Ala	His	Gly	Leu	Ile	Arg	Ala	
			100					105					110			
tgc	atg	ctg	gtg	cgg	aag	gtt	gct	ggg	ggt	cat	tat	gtc	caa	atg	gct	2185
Cys	Met	Leu	Val	Arg	Lys	Val	Ala	Gly	Gly	His	Tyr	Val	Gln	Met	Ala	
		115				120						125				
ctc	atg	aag	ttg	gcc	gca	ctg	aca	ggt	acg	tac	gtt	tat	gac	cat	ctc	2233
Leu	Met	Lys	Leu	Ala	Ala	Leu	Thr	Gly	Thr	Tyr	Val	Tyr	Asp	His	Leu	
	130					135					140					
acc	cca	ctg	cgg	gac	tgg	gcc	cac	gcg	ggc	cta	cga	gac	ctt	gcg	gtg	2281
Thr	Pro	Leu	Arg	Asp	Trp	Ala	His	Ala	Gly	Leu	Arg	Asp	Leu	Ala	Val	
145					150					155					160	
gca	gtt	gag	ccc	gtc	gtc	ttc	tct	gat	atg	gag	acc	aag	gtt	atc	acc	2329
Ala	Val	Glu	Pro	Val	Val	Phe	Ser	Asp	Met	Glu	Thr	Lys	Val	Ile	Thr	
				165					170					175		
tgg	ggg	gca	gac	acc	gcg	gcg	tgt	ggg	gac	atc	atc	ttg	ggc	ctg	ccc	2377
Trp	Gly	Ala	Asp	Thr	Ala	Ala	Cys	Gly	Asp	Ile	Ile	Leu	Gly	Leu	Pro	
			180					185					190			
gtc	tcc	gcc	cg	agg	ggg	agg	gag	ata	cat	ctg	gga	ccg	gca	gac	agc	2425
Val	Ser	Ala	Arg	Arg	Gly	Arg	Glu	Ile	His	Leu	Gly	Pro	Ala	Asp	Ser	
		195					200					205				
ctt	gaa	ggg	cag	ggg	tgg	cga	ctc	ctc	gcg	cct	att	acg	gcc	tac	tcc	2473
Leu	Glu	Gly	Gln	Gly	Trp	Arg	Leu	Leu	Ala	Pro	Ile	Thr	Ala	Tyr	Ser	
	210					215					220					
caa	cag	acg	cga	ggc	cta	ctt	ggc	tgc	atc	atc	acc	agc	ctc	aca	ggc	2521
Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly	Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly	
225					230					235					240	
cgg	gac	agg	aac	cag	gtc	gag	ggg	gag	gtc	caa	gtg	gtc	tcc	acc	gca	2569
Arg	Asp	Arg	Asn	Gln	Val	Glu	Gly	Glu	Val	Gln	Val	Val	Ser	Thr	Ala	
				245				250						255		
aca	caa	tct	ttc	ctg	gcg	acc	tgc	gtc	aat	ggc	gtg	tgt	tgg	act	gtc	2617
Thr	Gln	Ser	Phe	Leu	Ala	Thr	Cys	Val	Asn	Gly	Val	Cys	Trp	Thr	Val	
			260					265					270			
tat	cat	ggt	gcc	ggc	tca	aag	acc	ctt	gcc	ggc	cca	aag	ggc	cca	atc	2665
Tyr	His	Gly	Ala	Gly	Ser	Lys	Thr	Leu	Ala	Gly	Pro	Lys	Gly	Pro	Ile	
		275					280					285				
acc	caa	atg	tac	acc	aat	gtg	gac	cag	gac	ctc	gtc	ggc	tgg	caa	gcg	2713
Thr	Gln	Met	Tyr	Thr	Asn	Val	Asp	Gln	Asp	Leu	Val	Gly	Trp	Gln	Ala	
	290					295					300					
ccc	ccc	ggg	gcg	cgt	tcc	ttg	aca	cca	tgc	acc	tgc	ggc	agc	tcg	gac	2761
Pro	Pro	Gly	Ala	Arg	Ser	Leu	Thr	Pro	Cys	Thr	Cys	Gly	Ser	Ser	Asp	
305					310					315					320	

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ctt	tac	ttg	gtc	acg	aag	cat	gcc	gat	gtc	att	ccg	gtg	cgc	cgg	cgg	2809
Leu	Tyr	Leu	Val	Thr	Lys	His	Ala	Asp	Val	Ile	Pro	Val	Arg	Arg	Arg	
				325					330					335		
ggc	gac	agc	agg	ggg	agc	cta	ctc	tcc	ccc	cgg	ccc	gtc	tcc	tac	ttg	2857
Gly	Asp	Ser	Arg	Gly	Ser	Leu	Leu	Ser	Pro	Arg	Pro	Val	Ser	Tyr	Leu	
			340					345					350			
aag	ggc	tct	tcg	ggc	ggt	cca	ctg	ctc	tgc	ccc	tcg	ggg	cac	gct	gtg	2905
Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu	Leu	Cys	Pro	Ser	Gly	His	Ala	Val	
			355				360					365				
ggc	atc	ttt	cgg	gct	gcc	gtg	tgc	acc	cga	ggg	gtt	gcg	aag	gcg	gtg	2953
Gly	Ile	Phe	Arg	Ala	Ala	Val	Cys	Thr	Arg	Gly	Val	Ala	Lys	Ala	Val	
	370					375					380					
gac	ttt	gta	ccc	gtc	gag	tct	atg	gaa	acc	act	atg	cgg	tcc	ccg	gtc	3001
Asp	Phe	Val	Pro	Val	Glu	Ser	Met	Glu	Thr	Thr	Met	Arg	Ser	Pro	Val	
385					390					395					400	
ttc	acg	gac	aac	tcg	tcc	cct	ccg	gcc	gta	ccg	cag	aca	ttc	cag	gtg	3049
Phe	Thr	Asp	Asn	Ser	Ser	Pro	Pro	Ala	Val	Pro	Gln	Thr	Phe	Gln	Val	
				405					410					415		
gcc	cat	cta	cac	gcc	cct	act	ggt	agc	ggc	aag	agc	act	aag	gtg	ccg	3097
Ala	His	Leu	His	Ala	Pro	Thr	Gly	Ser	Gly	Lys	Ser	Thr	Lys	Val	Pro	
			420					425					430			
gct	gcg	tat	gca	gcc	caa	ggg	tat	aag	gtg	ctt	gtc	ctg	aac	ccg	tcc	3145
Ala	Ala	Tyr	Ala	Ala	Gln	Gly	Tyr	Lys	Val	Leu	Val	Leu	Asn	Pro	Ser	
		435					440					445				
gtc	gcc	gcc	acc	cta	ggt	ttc	ggg	gcg	tat	atg	tct	aag	gca	cat	ggt	3193
Val	Ala	Ala	Thr	Leu	Gly	Phe	Gly	Ala	Tyr	Met	Ser	Lys	Ala	His	Gly	
	450					455					460					
atc	gac	cct	aac	atc	aga	acc	ggg	gta	agg	acc	atc	acc	acg	ggt	gcc	3241
Ile	Asp	Pro	Asn	Ile	Arg	Thr	Gly	Val	Arg	Thr	Ile	Thr	Thr	Gly	Ala	
465					470					475					480	
ccc	atc	acg	tac	tcc	acc	tat	ggc	aag	ttt	ctt	gcc	gac	ggt	ggt	tgc	3289
Pro	Ile	Thr	Tyr	Ser	Thr	Tyr	Gly	Lys	Phe	Leu	Ala	Asp	Gly	Gly	Cys	
				485					490					495		
tct	ggg	ggc	gcc	tat	gac	atc	ata	ata	tgt	gat	gag	tgc	cac	tca	act	3337
Ser	Gly	Gly	Ala	Tyr	Asp	Ile	Ile	Ile	Cys	Asp	Glu	Cys	His	Ser	Thr	
			500					505					510			
gac	tcg	acc	act	atc	ctg	ggc	atc	ggc	aca	gtc	ctg	gac	caa	gcg	gag	3385
Asp	Ser	Thr	Thr	Ile	Leu	Gly	Ile	Gly	Thr	Val	Leu	Asp	Gln	Ala	Glu	
		515					520					525				
acg	gct	gga	gcg	cga	ctc	gtc	gtg	ctc	gcc	acc	gct	acg	cct	ccg	gga	3433
Thr	Ala	Gly	Ala	Arg	Leu	Val	Val	Leu	Ala	Thr	Ala	Thr	Pro	Pro	Gly	
	530					535					540					
tcg	gtc	acc	gtg	cca	cat	cca	aac	atc	gag	gag	gtg	gct	ctg	tcc	agc	3481
Ser	Val	Thr	Val	Pro	His	Pro	Asn	Ile	Glu	Glu	Val	Ala	Leu	Ser	Ser	
545					550					555					560	
act	gga	gaa	atc	ccc	ttt	tat	ggc	aaa	gcc	atc	ccc	atc	gag	acc	atc	3529
Thr	Gly	Glu	Ile	Pro	Phe	Tyr	Gly	Lys	Ala	Ile	Pro	Ile	Glu	Thr	Ile	
				565					570					575		
aag	ggg	ggg	agg	cac	ctc	att	ttc	tgc	cat	tcc	aag	aag	aaa	tgc	gat	3577
Lys	Gly	Gly	Arg	His	Leu	Ile	Phe	Cys	His	Ser	Lys	Lys	Lys	Cys	Asp	
			580					585					590			

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gag	ctc	gcc	gcg	aag	ctg	tcc	ggc	ctc	gga	ctc	aat	gct	gta	gca	tat	3625
Glu	Leu	Ala	Ala	Lys	Leu	Ser	Gly	Leu	Gly	Leu	Asn	Ala	Val	Ala	Tyr	
		595					600					605				
tac	cgg	ggc	ctt	gat	gta	tcc	gtc	ata	cca	act	agc	gga	gac	gtc	att	3673
Tyr	Arg	Gly	Leu	Asp	Val	Ser	Val	Ile	Pro	Thr	Ser	Gly	Asp	Val	Ile	
	610					615					620					
gtc	gta	gca	acg	gac	gct	cta	atg	acg	ggc	ttt	acc	ggc	gat	ttc	gac	3721
Val	Val	Ala	Thr	Asp	Ala	Leu	Met	Thr	Gly	Phe	Thr	Gly	Asp	Phe	Asp	
625					630					635					640	
tca	gtg	atc	gac	tgc	aat	aca	tgt	gtc	acc	cag	aca	gtc	gac	ttc	agc	3769
Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys	Val	Thr	Gln	Thr	Val	Asp	Phe	Ser	
				645					650					655		
ctg	gac	ccg	acc	ttc	acc	att	gag	acg	acg	acc	gtg	cca	caa	gac	gcg	3817
Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu	Thr	Thr	Thr	Val	Pro	Gln	Asp	Ala	
			660					665					670			
gtg	tca	cgc	tcg	cag	cgg	cga	ggc	agg	act	ggt	agg	ggc	agg	atg	ggc	3865
Val	Ser	Arg	Ser	Gln	Arg	Arg	Gly	Arg	Thr	Gly	Arg	Gly	Arg	Met	Gly	
		675					680					685				
att	tac	agg	ttt	gtg	act	cca	gga	gaa	cgg	ccc	tcg	ggc	atg	ttc	gat	3913
Ile	Tyr	Arg	Phe	Val	Thr	Pro	Gly	Glu	Arg	Pro	Ser	Gly	Met	Phe	Asp	
	690					695					700					
tcc	tcg	gtt	ctg	tgc	gag	tgc	tat	gac	gcg	ggc	tgt	gct	tgg	tac	gag	3961
Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr	Asp	Ala	Gly	Cys	Ala	Trp	Tyr	Glu	
705					710					715					720	
ctc	acg	ccc	gcc	gag	acc	tca	gtt	agg	ttg	cgg	gct	tac	cta	aac	aca	4009
Leu	Thr	Pro	Ala	Glu	Thr	Ser	Val	Arg	Leu	Arg	Ala	Tyr	Leu	Asn	Thr	
				725					730					735		
cca	ggg	ttg	ccc	gtc	tgc	cag	gac	cat	ctg	gag	ttc	tgg	gag	ggc	gtc	4057
Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp	His	Leu	Glu	Phe	Trp	Glu	Gly	Val	
			740					745					750			
ttt	aca	ggc	ctc	acc	cac	ata	gac	gcc	cat	ttc	ttg	tcc	cag	act	aag	4105
Phe	Thr	Gly	Leu	Thr	His	Ile	Asp	Ala	His	Phe	Leu	Ser	Gln	Thr	Lys	
		755					760					765				
cag	gca	gga	gac	aac	ttc	ccc	tac	ctg	gta	gca	tac	cag	gct	acg	gtg	4153
Gln	Ala	Gly	Asp	Asn	Phe	Pro	Tyr	Leu	Val	Ala	Tyr	Gln	Ala	Thr	Val	
	770					775					780					
tgc	gcc	agg	gct	cag	gct	cca	cct	cca	tcg	tgg	gac	caa	atg	tgg	aag	4201
Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro	Pro	Ser	Trp	Asp	Gln	Met	Trp	Lys	
785					790					795					800	
tgt	ctc	ata	cgg	cta	aag	cct	acg	ctg	cac	ggg	cca	acg	ccc	ctg	ctg	4249
Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr	Leu	His	Gly	Pro	Thr	Pro	Leu	Leu	
				805					810					815		
tat	agg	ctg	gga	gcc	gtt	caa	aac	gag	gtt	act	acc	aca	cac	ccc	ata	4297
Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn	Glu	Val	Thr	Thr	Thr	His	Pro	Ile	
			820					825					830			
acc	aaa	tac	atc	atg	gca	tgc	atg	tcg	gct	gac	ctg	gag	gtc	gtc	acg	4345
Thr	Lys	Tyr	Ile	Met	Ala	Cys	Met	Ser	Ala	Asp	Leu	Glu	Val	Val	Thr	
		835					840					845				
agc	acc	tgg	gtg	ctg	gta	ggc	gga	gtc	cta	gca	gct	ctg	gct	gcg	tat	4393
Ser	Thr	Trp	Val	Leu	Val	Gly	Gly	Val	Leu	Ala	Ala	Leu	Ala	Ala	Tyr	
		850				855					860					

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tgc	ctg	aca	aca	ggc	agc	gtg	gtc	att	gtg	ggc	agg	atc	atc	ttg	tcc	4441
Cys	Leu	Thr	Thr	Gly	Ser	Val	Val	Ile	Val	Gly	Arg	Ile	Ile	Leu	Ser	
865					870					875					880	
gga	agg	ccg	gcc	atc	att	ccc	gac	agg	gaa	gtc	ctt	tac	cgg	gag	ttc	4489
Gly	Arg	Pro	Ala	Ile	Ile	Pro	Asp	Arg	Glu	Val	Leu	Tyr	Arg	Glu	Phe	
				885					890					895		
gat	gag	atg	gaa	gag	tgt	gcc	tca	cac	ctc	cct	tac	atc	gaa	cag	gga	4537
Asp	Glu	Met	Glu	Glu	Cys	Ala	Ser	His	Leu	Pro	Tyr	Ile	Glu	Gln	Gly	
			900					905					910			
atg	cag	ctc	gcc	gaa	caa	ttc	aaa	cag	aag	gca	atc	ggg	ttg	ctg	caa	4585
Met	Gln	Leu	Ala	Glu	Gln	Phe	Lys	Gln	Lys	Ala	Ile	Gly	Leu	Leu	Gln	
		915					920					925				
aca	gcc	acc	aag	caa	gcg	gag	gct	gct	gct	ccc	gtg	gtg	gaa	tcc	aag	4633
Thr	Ala	Thr	Lys	Gln	Ala	Glu	Ala	Ala	Ala	Pro	Val	Val	Glu	Ser	Lys	
	930					935					940					
tgg	cgg	acc	ctc	gaa	gcc	ttc	tgg	gcg	aag	cat	atg	tgg	aat	ttc	atc	4681
Trp	Arg	Thr	Leu	Glu	Ala	Phe	Trp	Ala	Lys	His	Met	Trp	Asn	Phe	Ile	
945					950					955					960	
agc	ggg	ata	caa	tat	tta	gca	ggc	ttg	tcc	act	ctg	cct	ggc	aac	ccc	4729
Ser	Gly	Ile	Gln	Tyr	Leu	Ala	Gly	Leu	Ser	Thr	Leu	Pro	Gly	Asn	Pro	
				965					970					975		
gcg	ata	gca	tca	ctg	atg	gca	ttc	aca	gcc	tct	atc	acc	agc	ccg	ctc	4777
Ala	Ile	Ala	Ser	Leu	Met	Ala	Phe	Thr	Ala	Ser	Ile	Thr	Ser	Pro	Leu	
			980					985					990			
acc	acc	caa	cat	acc	ctc	ctg	ttt	aac	atc	ctg	ggg	gga	tgg	gtg	gcc	4825
Thr	Thr	Gln	His	Thr	Leu	Leu	Phe	Asn	Ile	Leu	Gly	Gly	Trp	Val	Ala	
		995					1000					1005				
gcc	caa	ctt	gct	cct	ccc	agc	gct	gct	tcc	gct	ttc	gta	ggc	gcc	ggc	4873
Ala	Gln	Leu	Ala	Pro	Pro	Ser	Ala	Ala	Ser	Ala	Phe	Val	Gly	Ala	Gly	
	1010					1015					1020					
atc	gct	gga	gcg	gct	gtt	ggc	agc	ata	ggc	ctt	ggg	aag	gtg	ctt	gtg	4921
Ile	Ala	Gly	Ala	Ala	Val	Gly	Ser	Ile	Gly	Leu	Gly	Lys	Val	Leu	Val	
1025					1030				1035						1040	
gat	att	ttg	gca	ggt	tat	gga	gca	ggg	gtg	gca	ggc	gcg	ctc	gtg	gcc	4969
Asp	Ile	Leu	Ala	Gly	Tyr	Gly	Ala	Gly	Val	Ala	Gly	Ala	Leu	Val	Ala	
				1045					1050					1055		
ttt	aag	gtc	atg	agc	ggc	gag	atg	ccc	tcc	acc	gag	gac	ctg	gtt	aac	5017
Phe	Lys	Val	Met	Ser	Gly	Glu	Met	Pro	Ser	Thr	Glu	Asp	Leu	Val	Asn	
			1060					1065					1070			
cta	ctc	cct	gct	atc	ctc	tcc	cct	ggc	gcc	cta	gtc	gtc	ggg	gtc	gtg	5065
Leu	Leu	Pro	Ala	Ile	Leu	Ser	Pro	Gly	Ala	Leu	Val	Val	Gly	Val	Val	
		1075					1080					1085				
tgc	gca	gcg	ata	ctg	cgt	cgg	cac	gtg	ggc	cca	ggg	gag	ggg	gct	gtg	5113
Cys	Ala	Ala	Ile	Leu	Arg	Arg	His	Val	Gly	Pro	Gly	Glu	Gly	Ala	Val	
	1090					1095					1100					
cag	tgg	atg	aac	cgg	ctg	ata	gcg	ttc	gct	tcg	cgg	ggt	aac	cac	gtc	5161
Gln	Trp	Met	Asn	Arg	Leu	Ile	Ala	Phe	Ala	Ser	Arg	Gly	Asn	His	Val	
1105					1110					1115					1120	
tcc	ccc	acg	cac	tat	gtg	cct	gag	agc	gac	gct	gca	gca	cgt	gtc	act	5209
Ser	Pro	Thr	His	Tyr	Val	Pro	Glu	Ser	Asp	Ala	Ala	Ala	Arg	Val	Thr	
				1125					1130					1135		

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cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac	5257
Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His	
1140 1145 1150	
cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta	5305
Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu	
1155 1160 1165	
aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag gcc	5353
Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Ala	
1170 1175 1180	
tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc	5401
Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe	
1185 1190 1195 1200	
tca tgt caa cgt ggg tac aag gga gtc tgg cgg ggc gac ggc atc atg	5449
Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met	
1205 1210 1215	
caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac	5497
Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn	
1220 1225 1230	
tgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat	5545
Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His	
1235 1240 1245	
gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc	5593
Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser	
1250 1255 1260	
ccg gcg cca aat tat tct agg gcg ctg tgg cgg gtg gct gct gag gag	5641
Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu	
1265 1270 1275 1280	
tac gtg gag gtt acg cga gtg ggg gat ttc cac tac gtg acg ggc atg	5689
Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met	
1285 1290 1295	
acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc	5737
Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe	
1300 1305 1310	
ttc aca gaa gtg gat ggg gtg cgg ttg cac agg tac gct cca gcg tgc	5785
Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys	
1315 1320 1325	
aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa	5833
Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln	
1330 1335 1340	
tac ccg gtt ggg tca cag ctc cca tgc gag ccc gaa ctg gac gta gca	5881
Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Leu Asp Val Ala	
1345 1350 1355 1360	
gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg	5929
Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr	
1365 1370 1375	
gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca	5977
Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser	
1380 1385 1390	
tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc	6025
Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr	
1395 1400 1405	

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cg	cat	gac	tcc	ccg	gac	gct	gac	ctc	atc	gag	gcc	aac	ctc	ctg	tgg	6073
Arg	His	Asp	Ser	Pro	Asp	Ala	Asp	Leu	Ile	Glu	Ala	Asn	Leu	Leu	Trp	
	1410					1415					1420					
cg	cag	gag	atg	ggc	ggg	aac	atc	acc	cg	gtg	gag	tca	gag	aat	aag	6121
Arg	Gln	Glu	Met	Gly	Gly	Asn	Ile	Thr	Arg	Val	Glu	Ser	Glu	Asn	Lys	
	1425				1430					1435					1440	
gta	gta	att	ttg	gac	tct	ttc	gag	ccg	ctc	caa	gcg	gag	gag	gat	gag	6169
Val	Val	Ile	Leu	Asp	Ser	Phe	Glu	Pro	Leu	Gln	Ala	Glu	Glu	Asp	Glu	
				1445					1450					1455		
agg	gaa	gta	tcc	ggt	ccg	gcg	gag	atc	ctg	cg	agg	tcc	agg	aaa	ttc	6217
Arg	Glu	Val	Ser	Val	Pro	Ala	Glu	Ile	Leu	Arg	Arg	Ser	Arg	Lys	Phe	
			1460					1465					1470			
cct	cga	gcg	atg	ccc	ata	tgg	gca	cg	ccg	gat	tac	aac	cct	cca	ctg	6265
Pro	Arg	Ala	Met	Pro	Ile	Trp	Ala	Arg	Pro	Asp	Tyr	Asn	Pro	Pro	Leu	
		1475					1480					1485				
tta	gag	tcc	tgg	aag	gac	ccg	gac	tac	gtc	cct	cca	gtg	gta	cac	ggg	6313
Leu	Glu	Ser	Trp	Lys	Asp	Pro	Asp	Tyr	Val	Pro	Pro	Val	Val	His	Gly	
	1490					1495					1500					
tgt	cca	ttg	ccg	cct	gcc	aag	gcc	cct	ccg	ata	cca	cct	cca	cg	agg	6361
Cys	Pro	Leu	Pro	Pro	Ala	Lys	Ala	Pro	Pro	Ile	Pro	Pro	Pro	Arg	Arg	
	1505				1510					1515					1520	
aag	agg	acg	ggt	gtc	ctg	tca	gaa	tct	acc	gtg	tct	tct	gcc	ttg	gcg	6409
Lys	Arg	Thr	Val	Val	Leu	Ser	Glu	Ser	Thr	Val	Ser	Ser	Ala	Leu	Ala	
				1525				1530						1535		
gag	ctc	gcc	aca	aag	acc	ttc	ggc	agc	tcc	gaa	tcg	tcg	gcc	gtc	gac	6457
Glu	Leu	Ala	Thr	Lys	Thr	Phe	Gly	Ser	Ser	Glu	Ser	Ser	Ala	Val	Asp	
			1540				1545						1550			
agc	ggc	acg	gca	acg	gcc	tct	cct	gac	cag	ccc	tcc	gac	gac	ggc	gac	6505
Ser	Gly	Thr	Ala	Thr	Ala	Ser	Pro	Asp	Gln	Pro	Ser	Asp	Asp	Gly	Asp	
		1555					1560					1565				
gcg	gga	tcc	gac	ggt	gag	tcg	tac	tcc	tcc	atg	ccc	ccc	ctt	gag	ggg	6553
Ala	Gly	Ser	Asp	Val	Glu	Ser	Tyr	Ser	Ser	Met	Pro	Pro	Leu	Glu	Gly	
	1570					1575					1580					
gag	ccg	ggg	gat	ccc	gat	ctc	agc	gac	ggg	tct	tgg	tct	acc	gta	agc	6601
Glu	Pro	Gly	Asp	Pro	Asp	Leu	Ser	Asp	Gly	Ser	Trp	Ser	Thr	Val	Ser	
	1585				1590					1595					1600	
gag	gag	gct	agt	gag	gac	gtc	gtc	tgc	tgc	tcg	atg	tcc	tac	aca	tgg	6649
Glu	Glu	Ala	Ser	Glu	Asp	Val	Val	Cys	Cys	Ser	Met	Ser	Tyr	Thr	Trp	
				1605				1610						1615		
aca	ggc	gcc	ctg	atc	acg	cca	tgc	gct	gcg	gag	gaa	acc	aag	ctg	ccc	6697
Thr	Gly	Ala	Leu	Ile	Thr	Pro	Cys	Ala	Ala	Glu	Glu	Thr	Lys	Leu	Pro	
			1620				1625						1630			
atc	aat	gca	ctg	agc	aac	tct	ttg	ctc	cgt	cac	cac	aac	ttg	gtc	tat	6745
Ile	Asn	Ala	Leu	Ser	Asn	Ser	Leu	Leu	Arg	His	His	Asn	Leu	Val	Tyr	
		1635					1640					1645				
gct	aca	aca	tct	cg	agc	gca	agc	ctg	cg	cag	aag	aag	gtc	acc	ttt	6793
Ala	Thr	Thr	Ser	Arg	Ser	Ala	Ser	Leu	Arg	Gln	Lys	Lys	Val	Thr	Phe	
	1650					1655					1660					
gac	aga	ctg	cag	gtc	ctg	gac	gac	cac	tac	cg	gac	gtg	ctc	aag	gag	6841
Asp	Arg	Leu	Gln	Val	Leu	Asp	Asp	His	Tyr	Arg	Asp	Val	Leu	Lys	Glu	
	1665				1670					1675					1680	

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atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag	6889
Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu	
1685 1690 1695	
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc	6937
Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly	
1700 1705 1710	
tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac	6985
Tyr Gly Lys Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His	
1715 1720 1725	
atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att	7033
Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile	
1730 1735 1740	
gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag	7081
Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu	
1745 1750 1755 1760	
aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg	7129
Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly	
1765 1770 1775	
gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc	7177
Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu	
1780 1785 1790	
cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga	7225
Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly	
1795 1800 1805	
cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct	7273
Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro	
1810 1815 1820	
atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag	7321
Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu	
1825 1830 1835 1840	
aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc	7369
Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala	
1845 1850 1855	
ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc	7417
Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile	
1860 1865 1870	
ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg	7465
Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg	
1875 1880 1885	
tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca	7513
Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr	
1890 1895 1900	
tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac	7561
Cys Tyr Leu Lys Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp	
1905 1910 1915 1920	
tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc	7609
Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser	
1925 1930 1935	
gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct	7657
Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala	
1940 1945 1950	

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atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa tac	7705
Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr	
1955 1960 1965	
gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac	7753
Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His	
1970 1975 1980	
gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc	7801
Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr	
1985 1990 1995 2000	
ccc ctt gcg cgg gct gcg tgg gag aca gct aga cac act cca gtc aat	7849
Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn	
2005 2010 2015	
tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg	7897
Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg	
2020 2025 2030	
atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa	7945
Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln	
2035 2040 2045	
ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att	7993
Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile	
2050 2055 2060	
gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc	8041
Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser	
2065 2070 2075 2080	
gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct	8089
Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala	
2085 2090 2095	
tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat	8137
Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His	
2100 2105 2110	
cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct	8185
Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala	
2115 2120 2125	
gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc	8233
Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu	
2130 2135 2140	
aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg	8281
Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp	
2145 2150 2155 2160	
ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt	8329
Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg	
2165 2170 2175	
gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg	8377
Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Leu Ser Val Gly	
2180 2185 2190	
gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca	8427
Val Gly Ile Tyr Leu Leu Pro Asn Arg *	
2195 2200	
ggccaatagg ccattcctgtt tttttccctt tttttttttt tttttttttt tttttttttt	8487
tttttttttt tttttctcctt tttttttcct ctttttttcc ttttttttcc ttttggtggct	8547
ccattcttagc cctagtcacg gctagctgtg aaaggtccgt gagccgcttg actgcagaga	8607
gtgctgatac tggcctctct gcagatcaag t	8638

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<210> 26
<211> 7
<212> RNA
<213> HCV

<400> 26
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7

<210> 27
<211> 6
<212> RNA
<213> HCV

<400> 27
gccagc

6

<210> 28
<211> 14
<212> DNA
<213> HCV

<400> 28
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14

<210> 29
<211> 6
<212> DNA
<213> E.coli

<400> 29
gaattc

6